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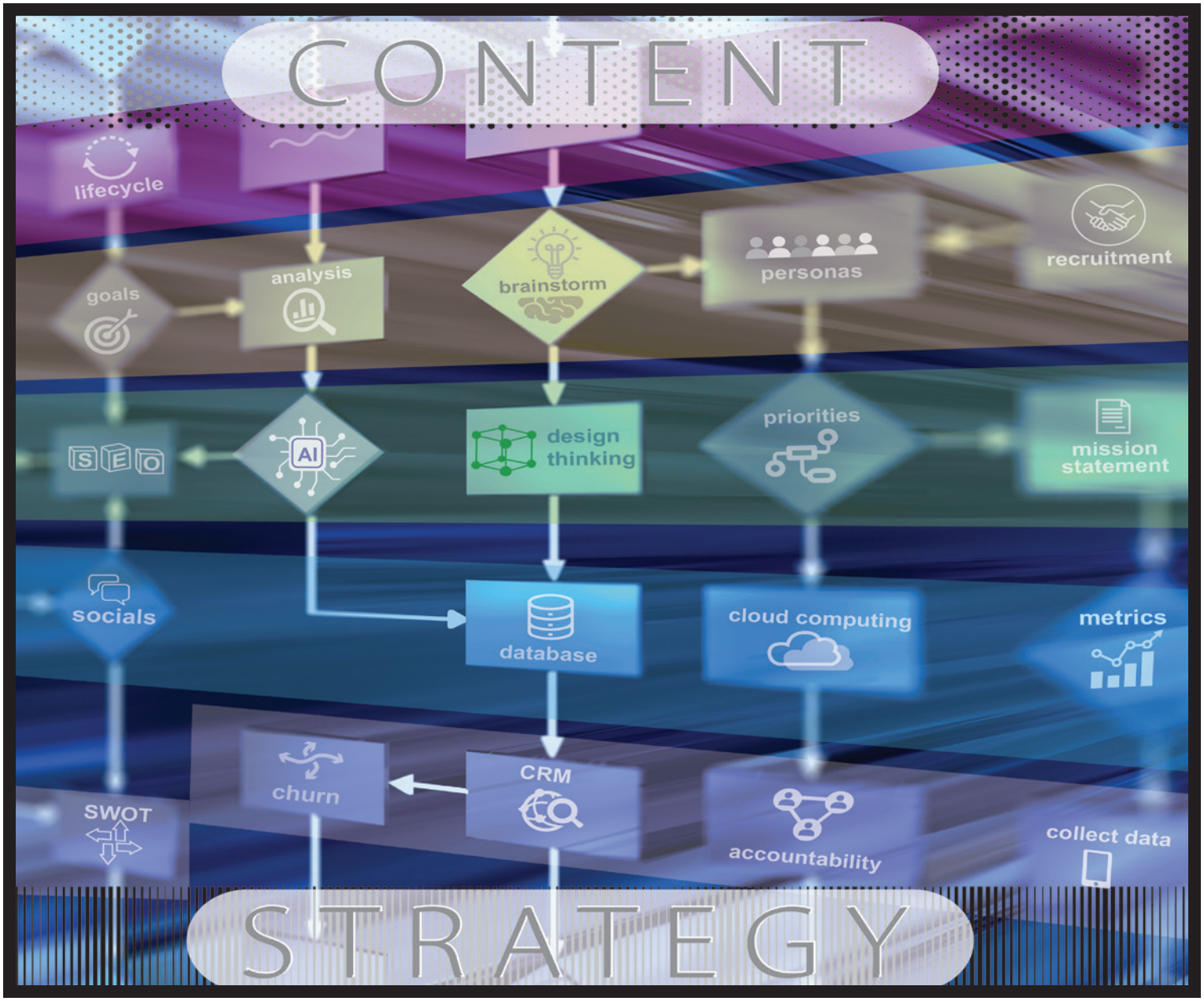

Technical COMMUNICATION

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Technical Communication is a peer-reviewed, quarterly journal published by the Society for Technical Communication (STC). It is aimed at an audience of technical communication practitioners and academics. The journal's goal is to contribute to the body of knowledge of the field of technical communication from a multidisciplinary perspective, with special emphasis on the combination of academic rigor and practical relevance.

Technical Communication publishes articles in five categories:

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Guiseppe Getto and Suzan Flanagan

The How-to of Content Strategy: Teaching, Training, and Application

Welcome to the special issue of *Technical Communication* on "The How-to of Content Strategy: Teaching, Training, and Application." When we proposed this special issue, we wanted to get a selection of articles that delved into how technical communication faculty can teach and train the next generation of content strategists. We got not only this but also several interesting articles on the application of content strategy in our field, thus shifting our focus slightly to include issues of application along with those of teaching and training.

Considering what content strategy teaching, training, and application means to the field of technical communication is a complex question. From past work in this area, we know that content strategists are people who primarily manage content across channels rather than develop technical documentation (Andersen, 2015). We also know a great deal about the workflows and skills associated with content strategy, as many technical communication researchers have contributed scholarship in this area (Albers, 2012; Albers & Mazur, 2003; Andersen & Batova, 2015; Batova, 2018; Batova & Andersen, 2015, 2016; Getto, Flanagan, & Labriola, 2023; Getto & Labriola, 2016; Pullman & Gu, 2008; Walwema, Sarat-St. Peter, & Chong, 2019). The field even has its first edited collection devoted to content management, an important subset of content strategy (Bridgeford, 2020), its first edited collection on the intersections of technical communication and content strategy (Getto, Labriola, & Ruszkiewicz, 2019), and its first textbook on content strategy (Getto, Labriola, & Ruszkiewicz, 2023).

And, of course, this research work wouldn't be possible without the scores of practitioners wrestling with these issues on a daily basis. Particularly, we are indebted to thought leaders at the intersections of technical communication and content strategy such as Scott Abel, Ann Rockley, Charles Cooper, Rahel Bailie, JoAnn Hackos, and many others (Bailie, 2019; Hackos, 2006; Rockley & Cooper, 2012; Rockley, Cooper, & Abel, 2015). These pioneers of content strategy within technical communication were the first to see the two fields as inherently interrelated. They've had a large impact on the practitioner's view of technical content, including how to manage it, how to publish it, how to deliver it, and how to govern it. Their work is mostly focused on questions of application as most of them have served as consultants for scores of organizations.

Readers can review the above books and articles if they want to learn more about what content strategy means for our field. From work like the above, we know that technical communicators are now responsible for things that were previously left to someone else, including

- Auditing technical content.
- Selecting and applying tools that will help them create and maintain effective documentation.
- Managing content within content management systems (CMSs) and component-based content management systems (CCMSs).
- Reusing content across channels more than ever before.
- Using analytics to understand how their audiences are using their content (or if they are).
- Building content models (or reusable frameworks) for content across channels.

Missing from much of this conversation is how we teach, train, and apply content strategy in our field. What binds the current special issue is the acknowledgment that content strategy is not going anywhere. In fact, it's becoming an increasingly important part of the lives of technical communication practitioners, many of whom are being asked to do tasks like those described above. This means that future technical communicators,

The How-to of Content Strategy

including technical communication students and early career professionals, will most likely have to do these tasks, too. As a field, this shift leaves us with a lot of questions, such as

- How can early career professionals learn about content strategy?
- How can senior technical communicators train junior colleagues in content strategy?
- How can faculty train students in content strategy?
- How can teachers and trainers encourage learners to develop leadership skills in the area of content strategy?
- How can technical communication practitioners and technical communication faculty deal with the ever-increasing importance of algorithms in the ways users consume content?
- How can technical communicators begin to grapple with the impact of AI on the development of technical content?

Now that we know that content strategy is here to stay, we need to understand the following: (1) How can we teach people about content strategy within academic technical communication programs? (2) How can we train existing technical communicators in content strategy skills that they need? and (3) How can we apply content strategy skills within technical communication? The authors in this special issue deal with these three overlapping areas in innovative, inspiring ways. Like those before them, they have waded into the turbulent waters of content strategy and come out the other side with some insights for the rest of us.

First, Elisabeth Kramer-Simpson presents a valuable article, "Content Auditing: Two Cases of Students Developing Auditing Criteria." Kramer-Simpson investigates best practices for teaching content auditing in two graduate classes tasked with auditing website content. Very little attention has been paid to content auditing in technical communication, much less to teaching it. Kramer-Simpson lays out a clear case for the challenges and opportunities of this important method for assessing and improving content.

Next, Kim Sydow Campbell, Ryan K. Boettger, and Val Swisher discuss the topic of content strategy leadership in "Challenges in Developing Technical Communication Leaders in Client-Based, Content Strategy Projects: A Teaching Case." Specifically, they examine challenges in developing technical communication students as organizational leaders through their analysis of a graduate course incorporating a client project. It is an open secret in the practitioner world that content strategy requires leadership to be successful. By introducing this important facet, the authors add an essential layer to the content strategy conversation while also providing a case study on how to teach content strategy leadership.

In his article, "SEO as Audience Analysis: Accounting for Algorithms in Content Strategy," Daniel Hocutt takes on the topic of algorithms and how they serve as a major, non-human audience for web-based content. Hocutt provides considerations for how content strategists can overlay data with their SEO strategies to better understand how successfully their strategies meet human and algorithmic audience expectations. This how-to component of content strategy can be deployed by researchers and practitioners alike in the classroom or in their own content.

Taking on a topic that will be of increasing importance to our field, Gustav Verhulsdonck, Jennifer Weible, Danielle Mollie Stambler, Tharon Howard, and Jason Tham discuss "Incorporating Human Judgment into AI-Assisted Content Development: An Exploratory Collective Case Study of a Heuristic for Evaluating AI-Generated Content." The authors make a powerful argument that human judgment is also needed when consulting AI-powered tools such as ChatGPT. For example, their findings indicate that ChatGPT is generally good at writing individual topics but performs less well when creating step-by-step task instructions. As technical communicators seek to utilize AI in their content generation and strategy, it will be important to recognize what these tools are good at and what they lack. This will also be the case as we introduce such tools to the classroom.

Finally, in "Understanding the Hidden User for Content Strategy," Nupoor Ranade explores how technical communicators are utilizing content in order to further an organization's goals. She argues that organizations need to be more purposeful about analyzing users' interactions with content in order to design infrastructures that support these interactions. This deep analysis carries with it important how-to considerations as researchers seek to understand how technical communicators use content in an era when advanced tools are becoming the norm. This kind of thinking should also inform our approach to teaching content strategy as the newest generation of technical communicators will no doubt utilize a wide variety of tools and workflows to deploy content.

Overall, we are eager to share these articles with the *Technical Communication* audience as we feel they are important pieces of the broader content strategy puzzle. Besides introducing new pedagogical considerations, these articles also challenge our current models for how technical communicators produce and deploy content. With tools such as AI on the horizon, the pace with which content workflows change will be reaching a fever pitch. Academics will need to pay close attention to the practitioner world if we want to keep up.

From a research standpoint, there are still many questions left unexplored regarding how content strategy is impacting our field. We still don't have a good model for what types of workflows students will face when they leave our classrooms to become content-focused professionals such as technical writers, technical editors, documentation managers, content developers, and content strategists. We also don't have a good handle on what types of tools they will need to utilize when performing their daily work tasks. Research that looks at these issues could push our pedagogies and approaches years ahead of their current state. In an era of increasing technology and complexity, we owe it to our students and colleagues to keep abreast of developments in content strategy as they will continue to impact the role of the technical communicator, a role that changes every time a new challenge emerges.

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ABOUT THE GUEST EDITORS

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On the Cover

ARTIST'S NOTES

"A content strategy is the planning, creation, publication, management, and governance of content. A great content strategy will attract and engage a target audience, meeting their needs while driving business goals." (source: https://blog.hubspot.com/marketing/content-marketing-plan)

There are many websites and blogs that discuss the basics of Content Strategy. I retrieved the primary key words and concepts and incorporated these, along with icons, to a stylized image of a hanging flow chart. The chart has many moving parts and remains flexible and responsive to change. Transparent color enhancements, icons, patterns, and text were designed using Adobe Illustrator 28.0.

Sources: Getty images: ID #157192883; Credit: enot-poloskun; https://blog.hubspot.com/marketing/content-marketing-plan; https://searchengineland.com/content-strategy-goals-394472

ABOUT THE ARTIST

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Content Auditing: Two Cases of Students Developing Auditing Criteria

https://doi.org/10.55177/tc222744

By Elisabeth Kramer-Simpson

ABSTRACT

Purpose: I investigated best practices for teaching content auditing within two graduate classes tasked with content auditing websites. I observed their strategies for developing auditing criteria. The graduate students used the audits to implement website redesign. Two research questions guided this study: 1) How do students create assessment criteria for website content audits? 2)What additional support could help students better determine assessment or rubric criteria to make them specific, and most of all, easily measurable? I focused on how and why students made auditing decisions.

Method: I taught two graduate classes in which the students worked with real clients and live websites. Part of the process the students learned and used was content auditing. I used case study, interviews, and text analysis to empirically investigate student auditing. Nine participants shared their perspectives, including students and clients.

Results: Simple categories with binary criteria made auditing easier; simple categories also made for simpler assessment. Students asked to see more examples of audits. Students in Class 1 misunderstood the audience, which led to a ripple effect on the resulting web design. Students from both classes were nonetheless able to make incremental improvements to both client websites.

Conclusion: Additional training in listening to clients is needed with graduate students who do content auditing of websites. Discussion of the impact of web content evaluation may be needed to help students discover how to tailor auditing guidelines to their specific clients. Practitioners may need recursive auditing to fully define criteria.

Keywords: Content Strategy, Content Auditing, Service-Learning, Web Design

Practitioner Takeaways

- Simple audit criteria, especially criteria that have clear standards or binary options, can be effective in content audits to improve websites.
- Students may not look deeply enough to see all audiences of a website, and require recursive evaluation.
- Content audits themselves can be a useful "how" and "why" web design explanation for clients and practitioners justifying revision decisions.

INTRODUCTION

Content auditing of communication channels has emerged as a tool to systematically assess the old content and to make a redesign more effective (Land, 2023; Rockley & Cooper, 2012). Academia has also employed this approach (Batova, 2021; Gonzales et al., 2016), though few academic articles cover content auditing before 2010 (Sperano, 2017, p. 3). More empirical research is needed on teaching content auditing to determine best practices for the classroom.

Teaching content auditing can be most effective when using a complex, real-world audience (Getto, Labriola, & Ruszkiewicz, 2020; Gonzales et al., 2016; Howard, 2020). Teaching technical communication using a "service-learning" approach involves real clients (and thus a real audience) (Bowden & Scott, 2002; Huckin, 1997; Sapp & Crabtree, 2002). The goal of service learning and content auditing websites is to support nonprofits who lack resources to do a website redesign themselves (Getto et al., 2023). Service-learning has been used in teaching content auditing (Batova, 2021; Getto & Labriola, 2016; Steiner, 2020) but is very labor intensive.

In order to learn more about service-learning in the content auditing context, I investigated two graduate classes who audited nonprofit websites and implemented redesigns. Two clients and seven students were interviewed retrospectively. Qualitative analysis of student audits, strategy documents, teacher reflections, and revised webpages were synthesized with the interview findings. Findings indicate that students had trouble understanding the multiple audiences for the websites and this impacted the website redesign. Further, students needed lots of scaffolding, recursive practice, and simple categories for the audit assessment criteria.

LITERATURE REVIEW

Content auditing provides a strategic way to look at what already exists within an organization's communication channels, and to re-tool the content to focus on achieving organizational goals and priorities. In this review, I first define content auditing, and then I discuss in brief how these tools are used particularly in university systems. I then further discuss service-learning as well as case studies of service-learning and content auditing. I conclude calling for additional case study research specifically on content auditing.

Defining Content Strategy and Content Auditing

The field trajectory has been to move from single sourcing to content management to content strategy, particularly within the last decade (Gonzales et al., 2016). Rockley and Cooper (2012) define content strategy for industry as "support[ing] both organizational goals and customer needs" (p. 13). Andersen (2014) describes content strategy as the "life cycle" of "intelligent content," which includes revisions, use in multiple contexts, and storage (p. 133). Content strategy looks at the big picture of the effectiveness of the content rather than the structure or document format (Albers, 2020). Content strategy is focused on the efficiency of communicating effective information to audiences (Bailie, 2024).

Content auditing is a technique and tool within content strategy. Rockley and Cooper (2012) provide a chapter dedicated to content auditing: "the purpose of a content audit is to analyze how content is written, organized, used, reused and delivered to its various audiences" (p. 102). They emphasize finding overlapping elements of content and unifying the content with a focus on reuse. Rockley and Cooper (2012) focus on the tasks and decisions of the audience to evaluate the content. Land (2023) wrote a handbook for content auditing and inventorying that includes many of these concepts and further clarifies criteria that can be used, including rating scales that may be helpful in auditing (pp. 60–84). In particular, Land (2023) suggests that user value for a website can be measured by categories such as "current," "accurate," and "easy to read." Getto et al. (2023) suggest similar categories like "readability," and accuracy in terms of "authoritativeness" (pp. 87–88). The part of content auditing I am most focused on in this article is the assessment or evaluation of pieces of content. Getto et al. (2023) define this part: "A content audit is also used to *assess* content, meaning to *measure its overall effectiveness* in the context of organizational goals and audience goals" (p. 73, emphasis original).

Tips from Getto et al. (2023) and Land (2023) include spreadsheet samples, ways to prioritize pages (since a website often had an overwhelming amount of content), and ways to develop a simple yes/no category (Getto et al., 2023, p. 83). The audit is a foundational

tool for knowing what exists in a content channel, and how that content can be revised and reorganized to become more effective for users.

Industry has used content auditing to conduct case analyses of websites. Altamirano and Stephens (2022) chart the workflow of their content audit. They showed the assessment process as recursive (see also Getto et al., 2023). Though Altamirano and Stephens (2022) provide sample audit pages, they compared so many different websites in their audit that it is difficult to see particular pieces or lines of the audit. Land (2023) added more cases in her second edition of *Content Audits and Inventories*, providing additional insight on issues of accessibility which have become prominent since the publication of website accessibility guidelines in the form of WCAG 2.0 (2008). This set of guidelines was formed to support web reading and usage for people with a variety of disabilities such as visual impairment, hearing loss, and some cognitive disabilities (among others). Getto et al. (2023), Land (2023) and Rayl (2021) suggest using the online guidelines provided via W3schools at https://www.w3.org/TR/WCAG21/.

Content auditing is used in university settings where there is a large quantity of content. Tang and Ding (2023) audited Chinese university websites and compared their English pages, including 35–75 pages per website (p. 363). They found that content on the English pages was often "irrelevant" or not "updated" (Tang & Ding, 2023, p. 366). Issues of outdated content is a common finding of content audits.

Another university audit, Texas Tech's library website audit, specifically focused on issues of accessibility (Rayl, 2021). Rayl (2021) reports that her audit covered more than 300 pages and took on average 2.5 hours per page. This emphasized the point that comprehensive auditing does in fact take a fair amount of time and can be "tedious" (Batova, 2021; Land, 2023).

Content Auditing and Service Learning

The complex context of a real organization in service-learning gives students real-world challenges that have long been praised in technical communication (Bowden & Scott, 2002; Huckin, 1997; Sapp & Crabtree, 2002; Scott, 2004) yet problems can arise (McEachern, 2001). Even good partnerships can turn sour (Mathieu, 2005; Mathieu 2012). Facilitating clear communication between the nonprofit client and students can require time and effort on the part of the instructor (Bay, 2022; Brizee, 2015; Bourelle, 2012; Grabill, 2012; Jacoby, 2015; Rivera & Gonzales, 2021). Developing and sustaining relationships with organizations requires trust and time in addition to teaching the instructional content.

Service-learning needs to benefit both students and the nonprofit. Brizee (2015) distinguishes between writing with and writing about the community, with the goal to work *with* the community (p. 144). Stoecker and Tryon (2009) prioritize the use of projects for both students and the *community.* Grant (2022) discusses the impact of this mutual benefit in the high stakes work for providing resources for families of homicide victims, who needed complete and professional work. Dush (2017) used a graduate student for further implementation of class projects. Nonprofits in rural areas may not have the bandwidth to implement student projects (Jacoby, 2015). Oversight from the instructor and use of existing partnerships within the university or community can help address some of these concerns (Batova, 2021; Bourelle, 2012; Getto & Labriola, 2016; Howard, 2020; Steiner, 2020).

Content strategists call for service-learning to teach content auditing (Getto et al. 2020; Howard, 2020). The "real" work context can provide more depth in audience and purpose for creating content strategy and knowing how to meet organizational goals. Batova (2021) used a content audit (p. 413) to focus on "sustainability" that later helped the class set up clickable prototypes of the website as a final deliverable. Focusing on a theme like sustainability gave students a goal to focus on in the content audit. However, the auditing is a brief mention in this article. More work is needed in case studies of content strategy to describe the how-to of content auditing, a first step in website redesign.

Using local organizations may help make audiences for the website content clearer (Gonzales et al., 2016; Steiner, 2020). Steiner (2020) mentions using an internal client of the department because it was "a client with which I was familiar" (p. 188). Steiner used students' knowledge of the department to address audience concerns.

Content auditing can help flesh out the organization's values if the instructor has a strong relationship with the organization (Howard, 2020; Steiner, 2020). Howard (2020) chose to work with an

organization with which he had a local connection. In his 2019 presentation at STC, Howard was noticeably moved by the mission of the organization. As a result of the connection, Howard had significant access to organizational communication and the graduate students were able to develop personas from a database of email communication within the organization. The content audit of the email database shaped recommendations and helped students identify the tendency of users to send short, "pithy" messages (Howard, 2020, p. 129).

Content audits in service-learning can be necessary first steps to scaffold larger website redesign. Steiner (2020) scaffolds her larger website redesign group project with individual smaller projects like a content audit. She mentions that the students found the audit "tedious" at first, but then used it as "a foundation" for their website recommendations (Steiner, 2020, p. 181). Auditing helped students talk about the website in a "consistent" way, rather than basing recommendations for redesign on their intuition or feeling (Steiner, 2020, p. 181). One of the strengths of auditing is that it gives justifications for evaluative decisions, rather than impulse redesigns.

This study aims to examine content auditing in two graduate classes that then used the audits to implement website redesign. The focus of the study is in unpacking how and why students made auditing decisions.

BACKGROUND

Our University and Students

Our university is a small, STEM-focused state institution with a reputation for research located in a rural part of the southwest. Our department houses the humanities and social sciences. We offer several undergraduate degrees in Psychology, Interdisciplinary Sciences, and Technical Communication. Students participating in the website redesigns came mostly from our MS in Public Engagement in Science, Design, and Communication. The program is interdisciplinary and involves science and technology studies, ethics, communication, and design practices. The graduate program emphasizes "community and public engagement" and the practical skills associated with implementing content strategy. Students in this program often hold full-time jobs at other research entities. They juggle classwork with family and work. Our department programs share the university vision to "solve real-world problems" and as a result, we prioritize hands-on, service-learning and client projects. This experience requires substantial planning and relationship building across department and community boundaries. We have worked with several nonprofits over the last few years. I endorse a long-term partnership model, and I had worked with these two clients over the last three years on multiple projects.

Class 1: Documentation

Class 1, a graduate class, emphasized documentation and used Garrett's (2011) text as a foundation, with chapters from Getto et al. (2020). Learning outcomes for the class involved iterative, agile processes for creating documentation that incorporated user testing. The client, Serena, asked for help restructuring her local health nonprofit website. Students collaborated with Serena, who did not have web training. She came to the class several times, once to provide context and issues for the website, and several more times to discuss the audit, the strategy document, the website structure, and page mock-ups. Students were given a handout derived from Getto (2020, p. 10) and the handout was 2/3 page with brief guidelines (see Appendix A). Foundational concepts such as "creating criteria by which content will be assessed that also meshes with the intended goals of the content strategy plan" guided ways that I helped students evaluate content (Getto et al., 2020, p. 10).

Four students divided the website and each inventoried a part of the website. One student with web experience in the workplace set the assessment criteria for the audit, and made categories such as outdated/current, redundant, action/information, and keep/change/delete. Students created a strategy document from the audit that included patterns and findings from looking at all the pages of the organization's website. One of the findings was, "Mixing info from different years for recurring events made the website hard to navigate." Another key finding was "Redundant info/videos," though part of this may be the students not understanding the full audience for the information. Students were given two weeks to complete the audit. Six weeks were spent on user testing and website mock-up development. The tree structure for the website redesign had a new page for volunteers, but did not have a central place for a data dashboard.

Class 2: Media, Communication, and Public Engagement

Class 2, also a graduate class, emphasized media, communication, and public engagement. Learning outcomes for the class included audience and branding connected to organizational goals, systematic identification of recurring issues in websites, and communicating those patterns to a variety of stakeholders. The textbook used was Getto et al.'s (2023) *Content Strategy: A How-to Guide*.

Six students divided up the webpages for our department and audited the existing website before implementing changes. Our client was primarily the department chair Gloria, who did not have web experience. Gloria came to class in early September to answer student questions about the website's design and purpose, and later in September to listen to and read students' findings from the audit. Gloria remained available for consultation throughout the implementation part of the project but did not return to class. Two students worked together on the department home page (though they each had separate program pages as well that they were responsible for), and two students worked together on the faculty pages. Two students worked independently on separate program pages: Technical Communication and Education.

Specifically, Getto et al.'s (2023) Chapter 4 on "Identifying Content Types and Channels" and Chapter 5 which is simply titled "Content Auditing" proved foundational. I broke the "Content Auditing" chapter into three parts that I taught over the course of three weeks. First, we as a class identified what Getto et al. (2023) term "MAST goals" for an organization (pp. 74–77) (an acronym focused on measurable, specific goals similar to SMART goals). The revised goal Getto et al. (2023) present as an example that further defines "mobile friendliness" was a concrete example I returned to often in our discussions (p. 77). We discussed the goals and audience needs for our department website as a large group over two days of class with an extra handout on how to inventory and identify client goals. We also discussed the assignment sheet (see Appendix B). In the second part of the three weeks, I asked students to focus on creating assessable, measurable criteria for the goals, as discussed in Getto et. al (2023, pp. 83–93). This was the most recursive process and where students struggled the most, which I will explain with student and client interviews in the results of this article. Finally, I spent several days discussing how to abstract patterns and create a strategy document that students could share with the client. The client returned to the class at the end of September to discuss plans for the website. Five weeks were then spent on webpage implementation with a week of that being dedicated to accessibility according to WCAG 2.0 guidelines.

METHODS

To examine how students developed content audits of the nonprofit organizations' websites, I chose a qualitative approach. I was interested to see how and why students made the rubric or criteria to assess the content on the website. I focused on content auditing specifically because for both of these websites, there was already a substantial amount of information in existence, but it was outdated and incomplete. Before we could recommend changes to the website, or plan a content strategy for the organization, we needed to know what was there. Two central research questions guided this empirical, reflective study:

1. How do students create assessment criteria for website content audits?
2. What additional support could help students better determine assessment or rubric criteria to make them specific, and most of all, easily measurable?

IRB Approval

I obtained Institutional Review Board (IRB) approval to retrospectively collect interviews and audits created for the class from students and clients. I did not mention student grades or my comments on the assignments as per the request from the IRB. Both the clients and students had copies of the documents I would be referencing before the interviews and understood (and signed) the consent to participate before the interviews. The IRB approved the study in November of 2023 as exempt. The IRB database number was 2023-11-001.

Participants

Two of the four students from Class 1's website redesign of the nonprofit's website agreed to participate in the study. Five of the six students from Class 2's website redesign of the university department's website agreed to participate in the study. Both clients agreed to participate in the retrospective interviews. In order to acknowledge the power differential between teacher and

students, and even clients and teacher, I "adopt[ed] the role of a learner as much as an expert and engage[d] with humility" (Rose & Cardinal, 2021, p. 83). I focused on listening carefully to participants, asking follow-up questions, and paraphrasing their answers to confirm. Participants were encouraged to select their own pseudonyms and as a researcher, I tried to "slow down, to listen and to share power" (Rose & Cardinal, 2021, p. 87). As with much qualitative, case study research, "sample sizes are usually much too small to warrant random selection," so I drew a "purposive sample, building in variety" (Stake, 2003, p. 152). In this case, variety included multiple classes, in-person and distance students, and a variety of background training in web design and content auditing.

Data Collection

I triangulated collection of rich, detailed descriptions of participants' actions through observation, text collection and analysis, and retrospective interviews from both students and clients. "Seeing data from multiple perspectives—for example using multiple researchers or multiple data collection techniques—increases rigor" (Hughes & Hayhoe, 2008, p. 81). In this case, the multiple perspectives involved both the students creating the audits and the organizational clients who asked for student support in redesigning their websites.

I noted students' struggles during classes with post-class notes. I collected students' content audit spreadsheets, their strategy synthesis documents based on the audits, and the to-do lists/agendas from Class 2. I also collected screen shots of the webpage redesigns. These texts served as a foundation for the retrospective interviews. Preparation for interviews involved 1–2 hours of analysis of the texts and included student-specific follow up questions.

Table 2: Data Collected

	Quantity of Data
Texts	15 student-created Excel sheets of Content-auditing 19 pages of strategy documents 10 pages of to-do lists
Interviews	200 minutes of discussion 9 participants
Observations	5 pages of class reflection 11 pages of handouts

Each interview lasted 30 minutes following the protocol (see Appendix C). Different questions were asked of clients and students, but both protocols averaged eight questions. Hughes and Hayhoe (2008) comment that for qualitative research, "if you want to know *why they do it,* or *how they feel about it*, then interviews and focus groups can be credible methods" (p. 79, emphasis original). I wanted to see the process behind the product that was created for the class. Questions in my protocol like "What information from class, handouts, textbook, etc. was helpful in setting up your content audit?" helped me understand scaffolding. More specific questions about the assessment criteria such as "How did you name the categories?" shed light on the rubric elements used to evaluate the pieces of content. I asked more closed questions about who the audience for these websites were (from both students and clients). Interviews were audio recorded and transcribed.

Table 1: Participants and Web Experience

	Student or Client	Experience with Web Design	Experience with content auditing	Mode of instruction
Catherine	Student, Class 1	Little in high school	None	In person
Ken	Student, Class 1	Advanced	None	In person
Sammy	Student, Class 2	Advanced	Some	Distance
Judge Brown	Student, Class 2	Little in college	None	In person
Renee	Student, Class 2	Some	Some	In person
Claudia	Student, Class 2	Some	Some	In person
Cassandra	Student, Class 2	Advanced	Some	In person/Distance
Serena	Client, Class 1	Little	None	In person
Gloria	Client, Class 2	Little	None	In person

Data Analysis

I looked for recurring themes across the classes. Hughes and Hayhoe (2008) write "Furthermore, for a qualitative study to have rigor, it must employ a formal, systematic technique for examining the data and finding patterns or common themes across the data" (p. 82). I first analyzed my observation notes and students' texts before the interviews with a focus on the rubrics used and the naming of the criteria for the audits. I use Huckin's (1992) context-sensitive textual analysis to limit the number of possible interpretations of student texts, in that "the number of plausible interpretations is constrained by various linguistic conventions that are manifested in the text" (p. 86). Huckin (1992) describes that the writer of these texts, in this case students authoring the content audit and strategy documents, had something in particular to communicate, and that message helped shape the direction of the interviews. I traced the assessment of the content through to the mock-ups or actual redesign of the webpages, noting changes deemed "successful" by the client from interviews and in-class commentary.

Recursively analyzing transcripts for emergent themes, I began by pulling quotes from transcripts on themes such as "use during implementation," "goals," or "naming criteria." I made separate documents with repeating categories for each class. Initial categories included awareness of client's goals, conversations with stakeholders in class, and information helpful in setting up the audit. Within those categories, specific examples such as "audience," "seeing," and "mobile friendly" arose as I analyzed the data a second and third time. I gathered responses on these themes within subsections of the transcript and refined the categories. I further refined "mobile friendly" and added in "scaffolding" to "seeing." Yes/no turned into "binary categories" on the spreadsheet and measuring the ease and consistency with which students used criteria.

RESULTS

Research Question 1: How Do Students Create Assessment Criteria for Website Content Audits?

To answer the first research question, "How do students create assessment criteria for website content audits?" findings were traced through analysis of student audits and retrospective interviews. Particular protocol questions that helped shed light on the development of student audits were "How did you learn about the organization's goals, values and purpose for the website?" and its follow up question, "What did you perceive as the purpose and audience for the website?" Another question from the student protocol that was critical in answering this research questions was: "How did you turn goals and values from the organization into assessable criteria for evaluating the inventoried pieces of content on the pages of the website? How did you name the categories?" In particular, I was interested in how students named the categories given the suggestions from Getto et al. (2023, pp. 85–93) (the students' textbook). My protocol questions and follow up questions answered how and why students created the content audit for the websites.

Close analysis of the students' transcripts and audits yielded several themes related to their naming and use of audit criteria. Recursively analyzing the students' issues and process through the transcripts and the audits, four themes emerged:

- Students found binary assessment categories easier to apply and define.
- Students had trouble identifying the audiences of the nonprofit.
- Students missed key elements of the website in their redesigns because of lack of audience awareness.
- Class 2 was able to effectively use a vague assessment category such as "mobile friendly" and still achieve a product that satisfied the client in the website redesign.

Students found binary assessment categories easier to apply and define

Categories students named for assessment were distributed into two columns based on how consistently students defined and used these categories:

Class 1. Some categories like current or outdated were easier for students to assess or determine as binary. For Class 1, elements like the distribution of face shields were relevant only during the Covid lockdown and were clearly not applicable anymore. Catherine marked these as outdated and correspondingly noted that this information should be deleted from the website. Catherine commented, "So

Table 3: Difficulty of Auditing Criteria

Difficult	Easy
Relevant (none used)	Current/Outdated (2 students Class 1, 2 students Class 2)
Accuracy/Authoritative (3 students, Class 2)	Spelling/Grammar (4 students, Class 2)
Credibility (none used)	Readability (1 student, Class 2)
Usability (2 students, Class 2)	Mobile Friendly (4 students, Class 2)
	Accessibility (1 student, Class 2)

I thought it wouldn't be a good idea if people went on the site and saw that they could get a face shield, but then that's a program that doesn't exist anymore." It is common for many websites, even banking websites, to have outdated content if there is no governance plan (Kenyon, 2024).

Class 2. Another category that was easy for students to check was spelling/grammar. In particular, Renee and Claudia mentioned the importance of checking faculty name spellings, including in publications written in another language. Students found this category easy to check, with clear answers to names being spelled correctly or not. Judge Brown and Sammy also used this category.

Mobile was a category that all five students checked on the display on their phones. Claudia in particular took several tries to edit the faculty main page to be "mobile friendly" and had to adjust the proportions of the pictures but achieved success in implementing the changes on the website for better mobile display. Cassandra also mentioned checking the webpages from the department on her mobile phone, as did Judge Brown, Sammy, and Renee. Mobile display was also a kind of binary category, with the display either reading clearly or with overlapping columns and text.

Accuracy/Authoritative proved a difficult category for many of the students to consistently use. Claudia knew to check with faculty (the subject matter experts for the department website). Only eight comments appeared in the audit in this category out of the 150+ comments in her audit criteria, four having to do with who was currently Chair of the department. Cassandra and Judge Brown used the accuracy category in name only. Cassandra's comments ranged from "irrelevant" (four instances) to "not accurate" (two instances) and were used in the context of comments about content being outdated. Judge Brown's category was named accuracy, but in reality, it was spelling and grammar. It was hard to maintain focus within this category.

Two students used "usability" in their audits but struggled to define this category. Cassandra pictured herself as the user and determined how many clicks were needed to get to important information. Sammy had the most defined rubrics to evaluate content. Sammy defined usability as "aligned to audience." She tailored website content to three different primary audiences in her website edits. The faculty member responsible for these pages was very happy with Sammy's work on the website. See Sammy's rubric below followed by a page of her audit:

Goals		
1. Readability/easy to find information	(headers, organization, titles, order of information)	
2. aligned to audience/meet audience needs and expectations	(faq, highlight good stuff, have information that competitors have)	
3. accuracy of information	(up to date)	
4. navigable	easy to navigate through the website	
Assessment criteria	**Criteria Pass (yes)**	**Criteria Fail (No)**
readability/usability	the information is easy to understand and find	the information is not readily obvious or is not obvious at all
aligned to audience	the information is what the intended audience needs and meets best practice, or is a common practice established by competitors	the information is not directly aligned to audience needs or doesn't not meet expectation based on best practice
content accurate	content is current, up to date without typos or spelling/grammar issues	content is inaccurate and has issues with spelling, grammar or not current
navigable	links to primary sources or links to other relevant information (no dead ends)	mentions but does not connect to a primary source, a dead end, must go back or search via a search engine

Figure 1: Sammy's Rubric and Auditing Criteria

Content Auditing

STEM Education Center	URL	https://www.nmt.edu/academics/teachereducation/	Overall Notes on Homepage	there is a secondary homepage that seems to be a dead link, psychology and educaiton but these pages are duplicated other places and not linked from the main class or academic page			
Content Description/Function	**Content Type**	**Readability/ usability**	**readability/usability**	**aligned to audience**	**Notes**	**Content Accurate and evergreen**	**Content Accuracy Notes**
Program Title	Text	Yes		Yes		Yes	
title of director/contact name	Text	Yes		Yes		Yes	Current contact
Purpose/program description/ Bold text	Text	No	long more than 60 characters	No	difficult to find with SEO	Yes	
program description bullet text	Text	No	have titles to understand releveance of information	No	hard to determine relevance of information	Yes	
logo	Image	NA		Yes		Yes	
Pathway description	Text	Yes		No	would expect this information with reset of program descritpion	Yes	
Buttons for each pathway	Links	Yes		No		Yes	
secondary button	Links	No	could have the description of the button for the secondary link	No		Yes	
bottom menu	Links	No		No	does not meet audience expectation on quality level, would expect a FAQ	No	out of date information

Figure 2: Sammy's Page of Auditing Using Criteria

Even Sammy, however, had trouble defining usability and her explanation of content that failed the usability category was "the information is not readily obvious or is not obvious at all." Asking Sammy "How do you define obvious?" could have further helped her in naming criteria for assessment.

Two categories mentioned in particular by Getto et al. (2023) and discussed in class were not used by the students: Relevance and Credibility. Students in Class 1 struggled to understand what "relevant" was in initial website discussions, so I discouraged the category. I more strongly discouraged Class 2 from using the category of relevant because it was less tangible to the students, and only Cassandra mixed that into her category on accuracy.

Practitioners defining auditing criteria may find that binary categories like spelling/grammar, mobile display, current/outdated may be easier to use when evaluating pieces of content because the standards are more clearly defined. This follows Getto et al.'s (2023) advice in the content audit chapter to use a yes/no category (p. 84). Usability may take additional definition, and accuracy may be a more difficult category which requires checks with subject matter experts.

Students had trouble identifying the audiences of the nonprofit

Class 1. Class 1 had trouble identifying the audiences for the nonprofit website. In order to help students better understand the audiences and goals of the nonprofit, I shared a document with notes about Serena, the website, and the organization. Serena attended class within the first three weeks of the semester. The students asked questions after Serena presented some additional context about the organization's goals and values. Serena commented that students' questions helped her self-reflect: "That really did make us sit there and go, 'Okay, what are we trying to do?'" Because especially since we were growing so fast, it is really hard to lose sight of those things." The organization had grown from a 2018 budget of $20,000 to a current 2024 budget of $600,000. The website had grown exponentially with the organization; there was no plan for the website. Due to this, it is possible that Serena had a hard time articulating some of the goals and audiences of the website.

Conversations with the client were helpful in teaching the students about the organization. In reflective interviews, students Catherine and Ken mentioned these conversations as teaching them about the organization and its audience. Ken mentioned that he also read the document I provided from an additional conversation I had with Serena. Both of the students interviewed from Class 1 had also worked with Serena in a previous class, so they had some exposure to the types of priorities and projects of the nonprofit. However, disconnects arose.

Serena, our client, in her retrospective interview, named "other nonprofits and providers" as a key audience for her nonprofit "because then if they [other nonprofits] needed something for other community members, or to write a grant or something like that" they could use this website as a resource.

The students were not aware of other local organizations using the website. When asked the question from the protocol "How did you learn about the organization's goals, values and purpose for the website?" and specifically what the audience was for the website, in the retrospective interview, Ken answered, "To get more people to either volunteer or get more funders, types of funders." He saw volunteers as the audience and had a vague idea of other funders looking at the website. Ken did not identify other local nonprofits as potential users. Catherine named the core goals for the nonprofit as "providing information to website visitors and having calls to action" for volunteering. The students clearly saw the audience as community members supporting the organization rather than other organizations who would need to use regional facts and information to leverage grant opportunities.

Class 2. Class 2 had fewer audience disconnects, but I was surprised that two students did not gather more information from the client visits. I asked Cassandra directly if she learned something from the visits from the faculty/clients beyond what she gleaned from the website and she said "no." I asked Judge Brown if he learned something from the client visits about audience and purpose of the website, and he mentioned "restructuring the website." Gloria noted students missed some of the secondary audiences, like "alumni and potential donors and the grading agencies who want to know expertise of various people [faculty] who might be on panels." Judge Brown and Cassandra focused more on the website itself and did not learn as much from the in-class conversations. Judge Brown did identify one of the goals of the department correctly as "one of their goals is to enroll students." Similarly, Cassandra understood in part the goal of the department as "[the department] wants to be clear on what classes are available in that degree field, what professors are available to reach out to if you have an interest in something specific in that department." It was easier for these students to identify goals for the department since they knew the organization well, even without input from the Chair or other faculty.

Students missed key elements of the website in their redesigns because of lack of audience awareness

Class 1. For Class 1, understanding the "data dashboard," a central feature of the website, was a key miss in the students' audit of the nonprofit website. Catherine mentioned she would have liked to know some of the sources of the data on the website, as there was a lot of information, but the organization and origin of the information was not always clear. This information could have helped her make a less arbitrary decision on what to keep, change, or delete, which she acknowledged in the retrospective interview as a "relatively subjective" decision. Catherine wasn't clear on why there was so much information on the website and had a hard time knowing how to treat this information in the content audit.

Catherine only used two audit rows for the data dashboard, one for the text blurb describing what it was

Title	Page	URL	Location (on page	Content type	Link Target	Category 1	Outdated or (	Redundant?	Action or Info	Event or Proj	Keep/Change/Delete
link, etc. It may be the same as a	find the thing. You can	url for the page	location on the	content is it?	link, where	might this	information still	content appear	the user to do	live activity	with it. Feel free to leave bl
Resource Guides and Information	Resource Guides	https://www.sco	Top	Text (title of page)		Resource	Current	No	Information	Project	Keep
Blurb advertizing data dashboard	Resource Guides	https://www.sco	Below title	Text with link	https://nmcdc.m	Resource	Current	No	Information	Project	Change
Embedded dashboard	Resource Guides	https://www.sco	Near top/middle	Interactive dashboar	https://nmcdc.m	Resource	Current	No	Information	Project	Keep
New Parent Guide	Resource Guides	https://www.sco	Left and middle	Text (section header	Copy text	Resource	Unsure	No	Information	Project	Keep
Blurb about "new parent guide"	Resource Guides	https://www.sco	Left and middle	Text		Resource	Unsure	No	Information	Project	Change
Image of new parent guide	Resource Guides	https://www.sco	Right and middle	Image		Resource	Unsure	No	Information	Project	Change
Mental health brochure	Resource Guides	https://www.sco	Left and middle	Embedded Google sl	https://docs.goo	Resource	Unsure	No	Information	Project	Keep
Mental Health Resource brochure	Resource Guides	https://www.sco	Right and middle	Text (section header	Copy text	Resource	Unsure	No	Information	Project	Keep
Blurb about "mental health resource bro	Resource Guides	https://www.sco	Right and middle	Text		Resource	Unsure	No	Information	Project	Change
2020- Updated Food and Mental Health	Resource Guides	https://www.sco	Right, near bottom	Text	Copy text	Resource	Unsure	No	Information	Project	Change
"Please Click on the Image to expand a	Resource Guides	https://www.sco	Right, near bottom	Text		Resource	Unsure	No	Information	Project	Change
"Please contact us for hard copies to di	Resource Guides	https://www.sco	Right, near bottom	Text	Copy text	Resource	Unsure	No	Information	Project	Change
Food and mental health resource guide	Resource Guides	https://www.sco	Left, near bottom	Embedded pdf	https://drive.goo	Resource	Unsure	No	Information	Project	Keep
Quote about Socorro County and SCOF	Resource Guides	https://www.sco	Bottom	Text		Resource	Unsure	No	Information	Project	Change
Maze of Life	Maze of Life	https://www.sco	Top	Text (title of page)		Past project	Outdated	No	Information	Recurring event	Change
Blurb about "maze of life"	Maze of Life	https://www.sco	Near top	Text		Past project	Outdated	No	Information	Recurring event	Change
Maze of Life photos	Maze of Life	https://www.sco	Middle and bottom	Images		Past project	Outdated	No	Information	Recurring event	Change
COVID Response	Face Shields and Saniti	https://www.sco	Top	Text (title of page)		Past project	Outdated	No	Information	Project	Change
Blurb about "COVID response"	Face Shields and Saniti	https://www.sco	Middle left	Text	Copy text	Past project	Outdated	No	Information	Project	Change
Image of volunteers/employees with ha	Face Shields and Saniti	https://www.sco	Middle right	Image		Past project	Outdated	No	Information	Project	Change
Image of employees with hand sanitizer	Face Shields and Saniti	https://www.sco	Near bottom left	Image		Past project	Outdated	No	Information	Project	Change

Figure 3: Catherine's Content Audit

and one for the link. She treated this as an external link and did not have extensive notes about the information included in this part of the site. She did mention in her comments on the audit that she felt the blurb was unclear and that was a signal that she was not understanding the purpose of this element of the website. Catherine was unclear about the role of the data dashboard, and thought it was for external funders to reference.

What may have been confusing to the students was in fact a key function of the client website. Serena commented in a follow up interview that "the data dashboard and certain things that we put a really, really high priority on being on our website, that was a little unclear with the students" and she felt that it was not reflected in the subsequent website tree structure or webpage redesign mock-up. Catherine's audit treated the data dashboard as another textual resource, equal to the PDF of the parent resource guide in the subsequent line of the audit. The relative importance of this part of the website was opaque to students.

A vague category like "mobile friendly" proved simple for website redesign

Class 2. A finding from content audit analyses, webpages, and student follow-up interviews was that students often used more generic constructs like "mobile friendly" but were still able to implement the changes to the website and make improvements.

Mobile display was only part of the issues addressed in each group. For example, Claudia and Renee audited the 40+ webpages associated with the faculty for the department. For example, nine faculty who left the university were still on the website and six faculty who were currently employed were not at all listed. Claudia commented, "I definitely went back [to the content audit] when I made my list for later as to my checklist, what I needed to do and stuff like that. I went back to the main page to make sure I didn't miss anybody." A few faculty pages showed up well on a phone, but most, and particularly the faculty homepage, did not display well on mobile devices.

In any assessment process, it is important to develop specific, clear criteria in order to consistently assess the content. In content auditing for website redesign, Getto et al. (2023) give a good example of how to take the term "mobile friendly" and give it concrete criteria like "calls to action in the top third of the page" (p. 76). However, in the context of Class 2, some students were

Figure 4: Mobile Display Problems

able to have a simple category of "mobile" without it being further defined. They edited the pages to view on mobile devices and made improvements to the website. The issue of mobile display was referenced and

prioritized by most of the students interviewed from Class 2: Claudia, Renee, Cassandra, and Judge Brown. All the students checked the university webpages on their phones when gauging the mobile display. However, even when I pointed to the book's suggestions on how to make the criteria more specific, the students' content audit criteria remained simple: "mobility, readability" or "mobile friendliness and layout."

Renee commented that the simplicity helped her: "We need something that's very direct to know what it is." Making the assessment criteria more specific seemed to be a burden, and students were able to implement changes even with the vague criteria. Despite the lack of specificity, the students' attention to mobile issues translated to effective mobile display on the revised pages. Initially, the faculty names read as overlapping columns.

Mobile display resolutions to the website may have been a "happy accident." When asked about how she made the page read well on a mobile device, Claudia at first couldn't remember. When I reminded her that the first publication of the new page had proportion distortions on the faculty pictures, Claudia recalled, "There was a couple of the faculty images that actually worked so I went in and I looked to see and there was just this one little click that I had to do to each one of them and then it fixed it." Through trial and error, and help from the OMNI content management system for the university website, Claudia was able to fix mobile issues on the faculty pages. See below for the faculty index page:

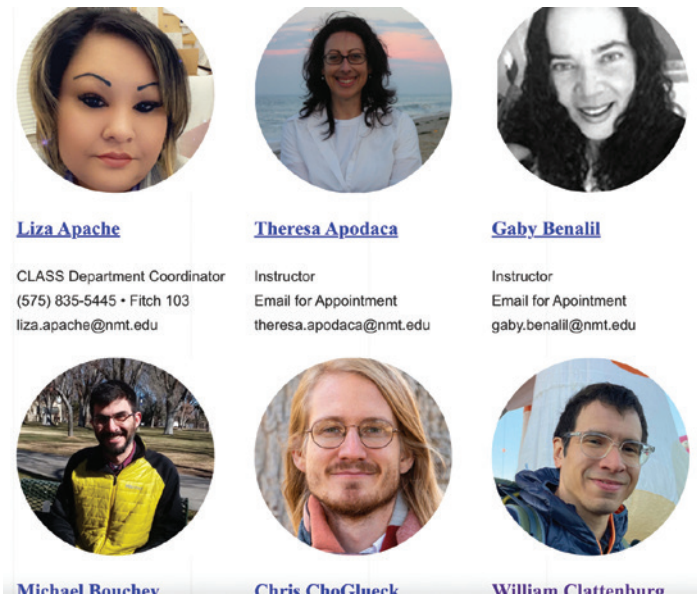

Figure 5: Mobile Issues Addressed

As Claudia mentioned, "it was just kind of a happy accident that it worked out." She dismissed this as a coincidence, but I believe the simplicity helped students focus on what to change and had a concrete measure (display on their phones) to compare revisions of the website.

Research Question 2: What Additional Support Could Help Students Better Determine Assessment Criteria?

To determine the kinds of additional support that would help students better determine assessment criteria for content audits, I triangulated findings from my teaching journals, my assignment sheets, retrospective interviews from the students, and recursive analysis of the students' content audit spreadsheets. Two themes emerged:

- Students preferred to see examples of the audit spreadsheets when developing their audits.
- Pre-setting audit criteria could help scaffold students in the auditing process.

Students preferred to see examples of audit spreadsheets when developing their audits

Several students in Class 2 mentioned how important it was to see content audit examples in order to create their own auditing spreadsheets and criteria. Cassandra mentioned in the retrospective interview that she wanted a list of resources to see examples of content audits. This points to the idea that seeing examples of audits are helpful in setting up content audits for websites. Claudia mentioned that it was key that other students shared their audits with the rest of the class. She liked "seeing Cassandra's and Judge Brown's, [as] I believe, he showed us his as well. Ours was definitely different than what they were doing, but it helped a lot, because we got to see what they did and it made sense." Cassandra mentioned that it was helpful to see a template in our textbook (Getto et al., 2023, p. 81). She remembers, "The book for the class did have a sample table layout of some of their headings, and so I grabbed some of those, and I ended up building that table very similar to that."

However, Cassandra notes that she made her own adaptations: "But then as I started going through the site and trying to apply them in the content audit, I was noticing that not all of them directly correlated to what we have on our website." Renee also thought that seeing Getto et al.'s (2023) layout was helpful, in addition to

Content Auditing

ment Website - Faculty Page Limited Content Audit							
Spelling/Grammar		Content Check with SME		Mobility - Readability		Missing Info	
Yes/No	Notes	Yes/No	Notes	Yes/No	Notes	Yes/No	Notes
				No			
						No	
None						No	
None							not sure
Yes (misspellings)	Becci's name is misspelled. Faculty that are no longer Teaching (Courses Taught) need to be removed from the list; J K--, N-- K--, -- P--, G-- SL--, ES R-- D-- , and M-- G - Theresa Apodaca is in the list twice, Juan Pineda needs his full name, Doug Dunston is in the list twice, Megha Khandelwal shouldn't be listed.			No		Yes	There are current faculty members who are not listed nor do they have they're own profile page

Figure 6: Excerpt from Claudia's Content Audit

other students' content audits. Claudia said simply, "I need a visual." Screen shots of content audits in case studies can be helpful for students learning the process. See a part of Claudia's content audit above.

Pre-setting particular criteria may scaffold student content auditing

Two students mentioned needing more scaffolding in setting the criteria in the auditing process. Judge Brown would have liked a little more guidance on what needed to be in assessment criteria and mentioned, "The professor could also match it to maybe his kind of criteria in a rubric form, just match it to what he or she has, and compare if we do it this way."

Judge Brown wanted a way for students to check their criteria against an instructor version. Some of his plans to change the website were just not feasible with the particular OMNI system, and he would have liked to know more of those restrictions in advance. Ken also felt that it would be a good idea to have base criteria from the instructor in the content audit. He further clarified that "some [categories] that they [students] have to have just so that they cover the basics, but then leave some of it up to them [students]." In this way, students would have chosen more scaffolded guidance in setting up the audit. Both of these students wanted the instructor to pre-set at least a couple criteria for the audit assessment so that they had a base to work from.

Students also varied on how much discussion was needed for them to understand the content auditing process, but Claudia, Renee, and Cassandra all appreciated the option to determine their own assessment criteria. Sammy, however, felt that she was "handed" the criteria for the audit, and would have liked more specific assignment guidelines instead of pre-set auditing criteria. Renee commented on the class discussion: "I feel like we still had some questions a week or two into this [content auditing], and then we were like, oh, that's what you meant, or this is what we were talking about. And there was some miscommunication or misunderstandings, and discussing it all together as a class was really helpful." Renee noted that initially she had a different opinion about what information was needed on the faculty pages (from her analysis of other university websites), but she learned to listen to faculty input and adopt some of their priorities in the development of a template for the faculty pages.

DISCUSSION

Teach Students to Listen to the Client!

The audiences in these two service-learning projects, as with many service-learning projects (Bowden & Scott, 2002; Gonzales et al., 2016; Grabill, 2016; Huckin, 1997; Mathieu, 2005; Sapp & Crabtree, 2002; Scott,

2004) were real and complex. As Howard (2020) mentions, having a real audience is good training for students who may not know how to evaluate website content according to organizational goals. In both classes, students saw part of the audience but not the whole. The students who saw the audience most clearly spent more time listening to the clients and realized that their values and priorities for the website differed from the clients' perspectives (particularly Sammy, Claudia, and Renee). Class 2 was more familiar with the audience for the department website but still had trouble seeing peripheral audiences. Judge Brown and Cassandra had a tendency to default to their own web preferences and experiences. Instructors of content auditing may need to train students to listen more actively to client and user needs in order to have students fully grasp the multiple audiences of websites.

Scaffold and "See" Evaluation

Another takeaway for instructors teaching content auditing is that recursively checking a draft of the audited website and evaluated content inventory is an important step before students move on to give the client strategy recommendations or even implement changes to the website. Scaffolding is an important part of teaching content auditing (Batova, 2021; Getto & Labriola, 2016; Steiner, 2020). I checked the inventory stage, but I did not ask enough questions about students' criteria for evaluating the effectiveness of the website. More feedback at this stage would, I believe, address Judge Brown and Ken's desire to have instructors predetermine criteria. Best practices (Altamirano & Stephens, 2022; Getto et al., 2023) and findings from this study indicate that instructors need to check the auditing process frequently and recursively.

Seeing audit samples helps students and practitioners alike. Land (2023) shows excerpts of case content audit spreadsheets. In particular, page 73 shares a sample criteria table with definitions of what gets rated 1, 2, or 3. Further, the case study by Jen Boland and TJ Peeler in Land's auditing book shows a table of using web analytics and prioritizing particular pages (2023, pp. 82–83). More examples of audits help us understand how to adapt criteria to our organizations. However, many companies are sensitive about their audits and the information can be proprietary (Rayl, 2021).

A possible additional support for graduate students doing a content audit is to teach more on "why" they are evaluating the effectiveness of information. Sammy wanted a rubric for the assignment; Judge Brown and Ken wanted the instructor to predetermine criteria. Part of a service-learning project is the authentic context. The "why" which I could have communicated to students more clearly was that they were discovering with me how to evaluate the websites. In this way, I was not handing students something that I predetermined, but I offered an opportunity for students to practice industry standards in real time.

Simplicity over Specificity for Students

Simplicity in the form of binary categories like spelling/grammar, outdated/current, or mobile friendly helped students evaluate content more clearly than other categories such as usability or authoritativeness. More examples of audit criteria, like Land's (2023) examples with screenshots of the actual website may better demonstrate the connection between audit and implementation. "Mobile-friendly" was critiqued by Getto et al. (2023) as being a nonspecific website assessment criterion. However, just determining whether website pages displayed readably on mobile phones was clear enough for students to implement changes that improved the website. Renee commented that the simplicity of "mobile friendly" made it easier for her to check the pages systematically and the resulting implementation was mobile-readable faculty pages. Gloria mentioned: "We ended up with a better website; we did."

CONCLUSION

Students found Getto et al. (2023) a useful guide for creating content auditing, but they wanted more samples of completed audits. Even after recursive practice, students' audit criteria were not always clearly defined. Emphasis on the effectiveness of pieces of website content need to be demonstrated with the resulting impact defined in example websites, so that students see the quality elements and tie it to systematic rubrics. Students often have a tendency to favor their own opinions on what makes a good website rather than listening to the client and may need repetitive training to unlearn this tendency. Students may find it difficult to prioritize an organization's goals for a

website over their own. Additional scaffolding with drafts, teacher comments, and perhaps a rubric for the activity of content auditing in subsequent iterations of the audit will help students create criteria that is specific for the audits. Practitioners may also find recursive practice helpful for clarifying auditing.

Limitations of this study include the sample size of the classes and the internal reflection of the teacher/researcher. With seven student participants, this is a small sample. This gives a case study snapshot, but more students and a quantitative survey of auditing practices or more questions focused on how criterion are named may better access questions of content auditing criteria, specifically.

One of the potential benefits to this study is that there is evidence that simple criteria, such as mobile friendly, may be enough to improve design. Even if criteria are not industry-specific, they may be clear enough to get the main idea implemented.

Future work could focus on content auditing specifically as a precursor to website redesign. Content auditing is a helpful check against otherwise subjective web design decisions. Additional research on how to communicate why audits are useful could ensure more buy-in among students. More blending of industry practice into the technical and professional communication classroom could offer additional skills that students could more directly implement in the workplace.

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APPENDIX A: CLASS 1 CONTENT AUDIT HANDOUT

Content Audit, in content strategy p. 10

Interview users regarding content needs (goals).

Create criteria by which content will be assessed that also meshes with the intended goals and objectives of the content strategy plan. (What makes it a success? Rating system? Rubric?) (Criteria vs. norm referenced grading).

Inventory all related content within a spreadsheet or other storage system that can easily be visualized and compared across documents (This will be important for documentation consistency).

Assess related content via the criteria developed at the beginning of the audit (for additions or deletions) and other decisions related to scope.

Analyze/identify patterns within the content assessed. What is effective and ineffective?

Consider best practices for content by comparing to other industry examples. Have a strategy and a plan.

Consider requirements for technology and readability and access (and justice). Think about the communication channels that the content will be delivered through.

Report the findings from the audit to stakeholders (in a succinct way, and with visuals) that accounts for and prioritizes the company/organization needs and values (and brand).

APPENDIX B: CLASS 2 CONTENT AUDIT ASSIGNMENT SHEET

Limited Content Audit of the CLASS Department Website and Strategy Report

You will need to select part of the class website for this limited content audit. You will use information gleaned from interviews with Taffeta Elliot, Matt Johnson, and Steve Simpson to create a deliverable spreadsheet analyzing the existing content, assessing that content with a rubric tied to the branding and strategy determined from interviews, and create a report highlighting themes and action to implement strategy in revision of the website. Please use Excel or Google Sheets for your spread sheet, and you will have columns to identify the type of content as well as assess it (for the assessment, use two columns, which we will go over in class). The report should be a brief 2 single-spaced pages, and at max 3. Use guidelines analyzed in class from a previous class sample, Chapters 4 and 5 in our textbook, and other resources provided. Remember that you must make these findings easily digestible and understandable for your stakeholders who have limited time and many other responsibilities.

First, develop with the class a set of MAST goals for this section of the website, and for the website as a whole. Remember: the goals are both the organization goals intersecting with the audience goals. These goals need to be specific and quantifiable against standards. In other words, your goal can't just be aesthetic because there is a lot of bias there, and you need to use someone else's specific design standards, or Google or WCAG 2.0 standards for measurement.

Create a spreadsheet and give links to the content, define the content type in a specific metadata way, and leave room for three-four assessment criteria. Make two columns for each assessment criteria, one that is yes/no, and one that leaves room for specifics.

Consider a numerical rating scale according to criteria. We will discuss developing a specific rubric on Thursday, September 14, 2023. Use pp. 83–93 in the textbook for ideas for the rubric and how to make the assessment specific and measurable. You'll need to know when you've reached your goal, and a yes/no on if it meets the assessment criteria or not. Some of the assessment criteria should help tailor that part of the website to its specific audience.

You will need to write up your findings in an easy-to-read way for Taffeta, Steve, Matt and others. Limit your strategy report document to 2 single-spaced pages please, and use specific headings and specific facts from your content audit to support the claims you are making about the CLASS department website. Prioritize themes into 3–4 achievable plans for improving the website to match the MAST goals discussed by the class and the assessment criteria you developed.

On a 3rd page, profile 2 personas for this section of the website, and give thorough information including pain points and how the CLASS website will help these people in their goals.

APPENDIX C: INTERVIEW PROTOCOL FOR STUDENTS AND CLIENTS

Content Audit Guiding Questions Protocol for students:

What experience do you have using a content audit approach to evaluating existing web content?

How did you learn about the organization's goals, values, and purpose for the website? What was helpful information in this stage? What would have been helpful to have in addition?

How did you turn goals and values from the organization into assessable criteria for evaluating the inventoried pieces of content on the pages of the website? How did you name the categories?

What information from class, handouts, textbook, etc. was helpful in setting up your content audit?

Would you have preferred if I as the instructor had set the assessment criteria and rubric?
Why/why not?

Did the direction from the textbook to have a yes/no column help in assessing pieces of content?

What was difficult transitioning between the organization's goals and values for the website and the assessment criteria?

Did you reference the content audit in later stages of the implementation of website changes?
Why/Why not?

Client Questions:

Why did you agree to work with students to redesign the website?

What goals did you have for the website redesign?

What do you remember of their presentations of content audit findings? Did you look at the content audit spreadsheets?

Did you read the strategy documents from the students? Did you rely on an oral presentation of the proposed changes and issues in the website?

How could we have better communicated this information, particularly main issues from the audit or patterns we saw?

What ideas the students proposed helped you re-see the website?

What do you wish the students had done differently?

What do you think the students didn't understand about your organization and its website?

Case Study

Challenges in Developing Technical Communication Leaders in Client-Based, Content Strategy Projects: A Teaching Case

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By Kim Sydow Campbell, Ryan K. Boettger, and Val Swisher

ABSTRACT

Purpose: This teaching case examines challenges in developing technical communication students as organizational leaders managing content strategy through analysis of a graduate course incorporating a client project.

Method: Forty-five graduate students enrolled in a content strategy course conducted content audits and assessments for six clients. Their final strategic roadmap reports were analyzed to determine their aptitude for aligning content strategies with business goals.

Results: While students adeptly identified technical content quality issues, the majority struggled to connect these to business implications. A minority of students explicitly linked their strategic recommendations to business metrics, such as revenue growth. This outcome suggests a deficiency in achieving the course's intent to instill a business-oriented approach to content strategy.

Conclusion: The case identifies several challenges, including client maturity levels, the intricacy of business contexts, and the ambitious scope of the course's objectives. Proposed enhancements involve restructuring client interaction, integrating more industry expertise, focusing the project's reporting component, and refining the course's aims. These measures aim to strengthen the strategic business thinking and leadership capabilities of technical communication students.

Keywords: Content Strategy, Organizational Leadership, Pedagogy, Content Operations

Practitioner's Takeaway

- Technical communication students, like their professional counterparts, struggle to connect content issues with business causes and effects.
- To foster technical communication leadership, content strategy coursework should emphasize content as a business asset.
- Client projects in content strategy education are crucial for real-world experience, connecting content strategy and tactics with business goals.
- Collaboration with an industry professional when designing a content strategy course is highly recommended.
- Multiple content strategy courses would allow more emphasis on the various phases of such projects, especially the earliest discovery phase which focuses on the connection between content issues and business issues, including processes and technologies for managing and delivering technical content (i.e., ContentOps).
- Integrating business courses such as marketing research or organizational behavior into the curriculum might better prepare students for content strategy roles.

INTRODUCTION

Jack Molisani, who specializes in recruiting for technical communication positions, wrote that the number one business skill needed by job candidates is the ability to describe their value in terms that support their employers' goals:

> It is a safe assumption to say many technical communicators don't truly understand that management's job is to decrease costs and increase revenue and market share, and therefore those technical communicators can't effectively communicate how they add to their organization's bottom line. (Molisani, 2021)

We could not agree more strongly.

Molisani's point is corroborated by industry surveys: 33% of technical communication practitioners could not report the value they provided to their employer in 2017 (Ludwig, 2021a), and 72% said they were not measured against specific content goals by their employer in 2020 (Ludwig, 2021b). When technical communicators cannot demonstrate how they contribute to their organization's goals, they lack business knowledge, which has many well-known, negative consequences that include lack of respect for the profession. Complaints about lack of respect for the technical communicator's role or skills are longstanding: limited organizational input (Rosselot-Merritt, 2020), poor treatment by internal customers (Rosende, 2016), stress from excessive workloads (Singer, 2001), inadequate advancement opportunities (Walsh, 2010), and so on. The complaints are both longstanding (Abel, 2007; Johnson, 2012) and global (Lopes & Godefroy, 2017). The perceived lack of respect and lack of business understanding signal a leadership vacuum within technical communication.

Building a better understanding of content and content creators as a business asset is a natural fit within content strategy coursework in technical communication degree programs. Content strategy professionals with technical communication roots have historically incorporated business value within their definitions of content strategy (e.g., Bailie & Urbina, 2013; O'Keefe et al., 2019; Rockley & Cooper, 2012; Swisher, 2014). Unlike their counterparts in marketing content strategy, they have dealt with the lack of budget for, and the resulting need for efficiency in, managing and delivering technical content in large organizations (i.e., ContentOps) since the beginning (Rockley & Cooper, 2012). In addition, there is evidence that more technical communicators are transitioning into content strategy work and that this more strategic role may put them in a position to earn higher salaries (Flanagan et al., 2022) as well as to avoid displacement by AI (Johnson, 2023). Trends also indicate technical communicators are rebranding themselves with alternate job titles—content designer, content specialist, content strategist—in attempts to better signal their skills in strategic thinking and business acumen (Albers, 2016). The strategic nature of content strategy work naturally identifies the content strategist as a leader.

In this paper, we share what we have learned about the challenges encountered in developing technical communication leaders in a content strategy course. We begin by summarizing our graduate-level, content strategy course. In particular, we identify the course materials that highlighted the status of content as a business asset. We then describe the six client projects completed by 45 students who took the course between 2021–2023. Finally, we gauge the potential of those 45 students to lead content strategy development at the conclusion of their projects by reporting and analyzing the recommendations they made in their strategic roadmap reports using the maturity model for content strategy development (Campbell & Swisher, 2023). We end by concluding that our goal of producing organizational content leaders remains a challenge and by offering avenues for overcoming it in the future.

COURSE DESIGN AND PROJECT OVERVIEW

Our master's-level course provides advanced study of content strategy for technical communicators, with six learning goals. The number one learning goal explicitly speaks to applying knowledge of business goals to technical content.

- Discussing technical content as a business asset and presenting content strategy development as a means of increasing business value.
- Gathering and organizing descriptive and quantitative/qualitative data about content performance through interviews of stakeholders, review of existing artifacts (e.g., personas,

customer journey maps, etc.), and use of software tools (e.g., Excel, Google Analytics, etc.).
- Analyzing quantitative/qualitative data about content performance to achieve strategic insights.
- Applying project management tools/techniques (e.g., charter, WBS, Kanban, Trello, status updates, etc.) during a team content strategy project.
- Reflecting on content strategy knowledge and skill development through written blog posts in a content management system (CMS) like WordPress.
- Demonstrating professionalism through timely submission of deliverables, constructive interpersonal interactions, acceptance of feedback, and upholding team commitments.

These learning goals dovetail with the skills identified as most critical in content strategy (Flanagan et al., 2022). It is important to note that we provide a separate course in digital literacies, which is responsible for learning goals in what has typically been labeled as content management in technical communication (Bridgeford, 2020; Pullman & Gu, 2020).

Our content strategy course is required for graduate students pursuing both the Master of Arts in Professional and Technical Communication and the Graduate Academic Certificate in Technical Writing. Between 2021 and 2023, the course was delivered four times in an eight-week, asynchronous online format, which is typical for courses in both programs. Forty-five students completed the course in this timeframe. They represented diverse undergraduate majors, from technical communication to English to journalism to secondary education to information technology. The types and amount of work experience among students were also diverse. A few students enrolled directly after finishing their undergraduate degree. A handful of students were supplementing their credentials as current college English teachers to begin teaching technical writing. However, most students were transitioning from their current careers to one in technical communication.

Instructional Materials Emphasizing Content as a Business Asset

Instructional materials in the course included an industry-focused, project-organized, content strategy book (Nichols, 2015). Additional industry-focused readings, webinars, and podcasts were assigned throughout the eight weeks, with major topics summarized in Table 1.

To convey the course's emphasis on content as a business asset, our number one learning goal, we detail below how four types of required, instructional material were used. First, one instructor video lecture introduced the learning objectives of the course, of which the first is understanding content as a business asset. Another explains several business concepts:
- Business value is understood as "profit" (see Figure 1). An extended definition and example are used.
- Unique value propositions explain how an organization's product (or service) benefits its customers and how it's different from what competitors offer. An example using organizational content is provided.
- Organizational silos typically result in content chaos, where accuracy, duplication and inconsistency between business units are the norm.
- Organizational hierarchy and the placement of content creators within an organization influence content governance (or its lack thereof).

For all organizations, including those that are nonprofit or public, profitability is key. More "profit" means expanding services for clients (Gunning, 2014) in addition to more money for owners or dividends for shareholders.

Second, the readings from Nichols (2015) described content strategy's relation to not only the content experience of users or customers but also to ContentOps (i.e., the organizational people, processes, and technologies used to create and manage content) and content governance (i.e., who makes decisions about it).

Third, recorded videos of professionals made several points about the relation between content and business. For instance, one clarified that content strategy is not owned by marketing units or professionals despite their adoption of the phrase to mean "content marketing" (Halvorson, 2020). In another instance, a professional stated that strategy is the analysis phase of a business problem that determines how content can lead to corporate success

Table 1. Topics and Organization of Instruction in the 8-Week Content Strategy Course

Week	General Focus of Instruction	Topics in Instructional Materials	Project Phase (Stage)	Project Deliverables
1	Viewing the Digital Content Strategy Landscape	Business value; content as a business asset; content lifecycle; governance; content silos; stakeholders; job descriptions for content strategists	Discovery (Planning)	CATME Team Formation Survey & Team Charter & Non-Disclosure Agreements
2	Planning a Content Strategy Project	Consulting process (discovery, gap analysis, & roadmap); stakeholders; requirements; listening; eliciting information; project management methods (agile, scrum, Kanban, waterfall & work breakdown structure); collaboration technology; status reporting	Discovery (Planning)	Team WBS/Kanban Board
3	Assessing Content	Content assessment process (inventory & audit); assessment technology; quantitative audit; analytics; reach, engagement, & conversion; qualitative audit; findability, usability, accuracy, brand voice, & business value	Discovery (Assessing)	Team Status Update
4	Defining the Gap	ContentOps; tactics vs. strategy; data vs. interpretation; content pruning; competitor or hero analysis; gap categories; client management	Gap Analysis (Defining)	Draft Team Audit Report
5	Designing for the Future	Content strategy maturity; information process maturity model (IPMM); content management systems & authoring tools	Roadmap (Designing)	Peer Reviews of Draft Team Audit Reports & Final Team Audit Reports & CATME Team Evaluation Survey
6	Designing for the Future	Structured authoring; reuse; single-sourcing; multi- or omni-channel publishing; controlled vocabulary; content models/templates	Roadmap (Designing)	
7	Designing Strategic Roadmaps	SWOT analysis; content management; ContentOps & business value	Roadmap (Designing)	Individual Status Update
8	Wrapping Up		Roadmap (Designing)	Individual Strategic Roadmap Report

(Bailie, 2020). In addition, our first client meeting showed the client representative introducing their organization, its customers, its goals, and its content team to the students.

Fourth, maturity models were introduced to focus specifically on content as a business asset. In Week 5 of the course, readings and the instructor's video-lecture taught students about maturity models and expanded on how to think about content strategically within an organization. We offer below more detail on how students learned to identify promising directions for content strategy based on their perceptions of client maturity.

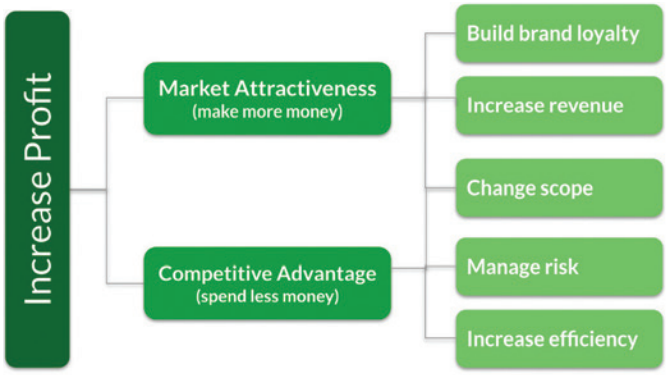

Figure 1. Increased Profit as the Goal and Justification for Content Strategy (adapted from Bailie & Urbina, 2013)

Challenges in Developing Technical Communication Leaders

The Content Strategy Development Maturity Model

Students read about Campbell and Swisher's (2023) maturity model for content strategy development, which is reproduced in Table 2. As Hackos wrote, "The purpose of a process maturity model is to provide guidance for organizations to establish best practices that promote excellence and ensure cost-effective outcomes" (2017, p. 1).

Campbell and Swisher (2023) explain their model and, in particular, the relationship between each of the IPMM characteristics in column one, the content tactics in column three, and business profitability with an extensive discussion of ContentOps. While we cannot repeat their discussion here, we will offer one critical example. If organizational structure for content work is not sufficiently mature (e.g., content professionals have little authority to influence processes), it must be the top priority in developing a strategic plan for content. The strategy must rely on a business case about the impact of centralized content authority on profitability to influence leaders. With evidence of lower profitability due to (a) lost revenue associated with content effectiveness and (b) increased expenses associated with the inefficiency of ContentOps (creating, managing, and distributing content), business leaders will be persuaded to pay attention to content in meaningful ways.

As Table 2 shows, the model displays tactics as the outcome of strategy (Bailie, 2024). For instance, one tactic for increasing maturity in organizational structure is governance, which can mean new policies for ContentOps across the organization that ultimately improve productivity. Students learned about

Table 2. The maturity model for content strategy development (Campbell & Swisher, 2023, p. 297)

IPMM Characteristic	Assessment of Maturity Level for Characteristic (Stevens, 2020)	Relevant Tactics for Increasing Maturity Level (Hane et al., 2019b)
Organizational Structure	Does the team have the power, authority, and infrastructure support to control its own processes and deliverables?	Governance, Stakeholder Interviews, Content Strategy Mission Statement
Hiring and Training	Does the organization recruit people with the appropriate skills for the position and provide training opportunities for career advancement and professional development?	Content Job Descriptions, Digital Content Training
Budget	Is the team in control of its own department budget?	None
Planning + Estimating, Scheduling, and Tracking	Is each documentation project planned before writing begins? Are individual projects allocated specific budgets and schedules and tracked against them?	Content Planning Calendar
User Focus	Does the team have direct access to users of their content and does that influence the way content is designed and written?	Content Analytics, Surveys/Testing Personas, Journey Maps
Information Design	Does content conform to a proven and consistent content strategy?	Surveys/Testing, Content Analytics, Content Models/Structured Content
Taxonomy	Is content categorized and tagged for easy findability?	Governance, Content Analytics, Surveys/Testing, Taxonomy/Metadata/Controlled Vocabulary, SEO
Quality Assurance	Are corporate writing standards apparent and consistently enforced?	Editorial Style Guide, Content Audit
Collaboration	Is content creation a team effort, taking advantage of the individual skills of each person?	Content Planning Calendar
Change Management	Does the organization plan for and embrace change?	None

governance throughout the course through a variety of instructional materials. Another tactic for increasing maturity in organizational structure is stakeholder interviews. These interviews are valuable as a means of building a business case for better governance by uncovering evidence of existing content issues—and potential allies within the organization (e.g., customer support). Students practiced some of this interviewing in the four client meetings although they were limited in meeting with only a single type of stakeholder.

In sum, instructional materials and course experiences were designed to expose the connections between the business and content. Evia recently wrote that ContentOps

> does not aim to commodify all communications in an organization. The goals, instead, should be to perceive and treat valuable pieces of content as business assets and to establish and maintain workflows that implement a strategy for the automation of routine tasks related to content creation and processing (2024, p. 7).

This was precisely the goal in our content strategy course. As a result of the instructional materials and their experience completing a content audit, we expected students to demonstrate competency in the number one learning goal by the end of the course.

The Client Project and Major Deliverables

Many content creation educators (Spring & Nesterenko, 2018), including those in technical and professional communication (Campbell & Katan, 2022; Dumlao, 2022; Howard, 2020; Kastman Breuch, 2001; Kimme Hea & Wendler Shah, 2016; Willerton, 2013) have reported on their use of client projects to introduce students to the contexts within which they will work after graduation. We also designed our content strategy course around a client project, envisioning that students would come to understand more about content strategy by working closely with authentic content and the people in organizations who own it.

In Week 1, students read and viewed a video with an overview of the client project and samples of the major deliverables. These explained that the course's instructional topics and deliverables (refer to Table 1) would move them through a client-based, content strategy project comprised of three phases based on the frameworks used by content strategy consultants (Bailie, 2020; Nichols, 2015; O'Keefe et al., 2019):

- **Discovery:** Teams planned their work and then inventoried and audited or assessed the client's content during this phase.
- **Gap Analysis:** Teams defined the gap between the client's current state (based on their content assessment) and the client's goals in this phase. For Discovery and Gap Analysis project phases, students were divided into small teams of two to four, based primarily on their responses about scheduling virtual teamwork using CATME Team-Maker (Layton et al., 2010). Team content assessment findings and gap analysis were delivered to clients and the instructor as a spreadsheet and brief report at the end of Week 5.
- **Roadmap:** Individual students designed a strategic report for their client, recommending strategies and tactics, based on their prior team efforts in the earlier phases of the project. Roadmap reports were delivered to the instructor at the end of Week 8.

In brief, the two major deliverables connected with the client project were the content assessment spreadsheet with its brief report at the end of the gap analysis phase and the strategic report at the end of the roadmap phase. Because it was crafted by individual students and focused on content as a business asset, the strategic roadmap report provided an excellent measure of the 45 students' ability to lead ContentOps within an organizational context.

The individual roadmap reports required four major types of information, described to students as shown in Figure 2. Thus, these reports offered data for assessing the success of our client-based project in meeting the #1 learning goal of the course:

- Research Question: Do students demonstrate knowledge of content as a business asset and present content strategy development as a means of increasing business value in a report after a client-based content audit?

With adequate knowledge of content as a business asset, we hoped our students would select strategic directions and content tactics, as well as justify those selections, based on their relative value to the client's business goals. Our research was exempt from IRB review because it involved data from existing instructor

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Figure 2. Required Information in the Strategic Roadmap Report Prepared by Individual Students After the Content Audit

records. In addition, the data contained no personally identifiable information because it was previously anonymized for grading purposes by the instructor.

The Clients and Content for The Content Strategy Project

Students performed their content strategy work for one of four business clients assigned to them randomly by the course instructor. Clients were recruited by the instructor, who leveraged contacts with alumni of the department's degree programs. All students signed a non-disclosure agreement (NDA) before gaining access to client information.

When clients initially agreed to participate, the instructor requested the following types of information to support students' content strategy work:

- An organizational representative who could provide or develop (with help):
  - A list of business pain points related to content (e.g., cost of or time to do updates, cost of translation, number of customer complaints due to findability or inconsistencies, etc.).
  - A content vision or goal.
  - Answers to questions about content maturity and other issues.
  - Access to the items listed below.
- A body of content. Ideally, it would be inter-related content but "owned" by separate units (customer support, sales, training, marketing, etc.).
- Data on content consumption (e.g., Google Analytics, MozBar, etc.).
- Existing style guides, personas, and customer journey maps related to the content.

Client representatives participated in four synchronous, virtual meetings with specific purposes based on the stage of the students' work on the content strategy project. **Week 1:** Introduce your company, products, customers, and competitors, as well as your role within the company. **Week 2:** Provide project content details, including business goals or KPIs (Key Performance Indicators). **Week 3:** Describe your content team workload and your access to users or customer data. Explain content governance and workflow or lifecycle. Answer student questions based on their content inventory and audit activities. **Week 4:** Answer student questions based on their competitor and gap analysis activities. Because students were enrolled in an asynchronous, online course, virtual meetings were scheduled based on client availability. Students were invited to attend

live or to submit questions in advance and to watch recorded meetings afterward.

Details for the client projects are summarized using pseudonyms in Table 3. As indicated in Table 3, the clients represented diverse industries, from a publicly traded B2B software enterprise to a small professional services firm. The content clients supplied for project work also varied, including user guides, developer documentation, product descriptions, and professional development trainings. We should note that two of the same business clients participated in the project in different terms. For Client A, the student experience was nearly identical in both terms. However, the client supplied two different sets of user guides with distinct functions for the same software product. For Client C, the student experience was distinct in each term, with two different client representatives representing distinct content types within the same organization.

RESULTS AND INTERPRETATION

We begin by sharing student perceptions of the content strategy project. Of the 28 whose anonymous comments were available from the institutionally administered course survey, 12 students named the project as what contributed most to their learning during the course and made positive comments like this one: "The content audit and assessment contributed most as it gave real experience in how to complete one and what could be expected when doing this type of work for a client." The only negative project comments came from two students, who said the immensity of the project detracted from their learning.

Although there is much we could say when sharing our findings from these client projects, we limit ourselves to examining two topics that help to answer our research question focused on student competency in the number one learning goal: presenting content strategy development as a means of increasing business value. First, we discuss the maturity levels of our six clients and the potential challenge that presented in promoting the idea of content as a business asset. Second, we present some illuminating examples of student successes (and a few failures) in treating content strategy development as a means of increasing business value.

Client Maturity Levels

In Figure 3, we display each client's maturity level, calculated as the average rating by the students who worked with them, with 5 representing the highest level. For inclusion in their report, students chose a scale from the maturity models covered in their instructional materials (Hackos, 2017; Hane et al., 2019b; Jones, 2018; Kunz, 2015). The highest levels

Table 3. Details for Six Client-based Content Strategy Projects

Client Label	Client Description	Client Rep Pseudo	Rep Position	Client Content for Audit	Academic Term	No. of Teams (Content Assessments)	No. of Students (Roadmap Reports)
A1	medium-size, privately owned, B2B software	Juan	tech writer	51 web-based user guides for software	Spring 2021	4	9
A2	medium-size, privately owned, B2B software	Juan	tech writer	57 user guides for the same software	Fall 2021	4	10
B	large enterprise, publicly traded, B2B software	Maya	tech docs manager	~100 pages in API developer portal	Fall 2021	4	10
		Ren	lead tech writer				
C1	small-size, privately owned, professional services	Sophie	comm manager	~250 web-based catalog descriptions	Summer 2022	1	3
C2	small-size, privately owned, professional services	Freya	training coordinator	~100 LMS-housed training courses	Spring 2023	2	6
D	medium-size, privately owned, B2B software	Yuusuf	tech writer	28 API user guides	Spring 2023	3	7

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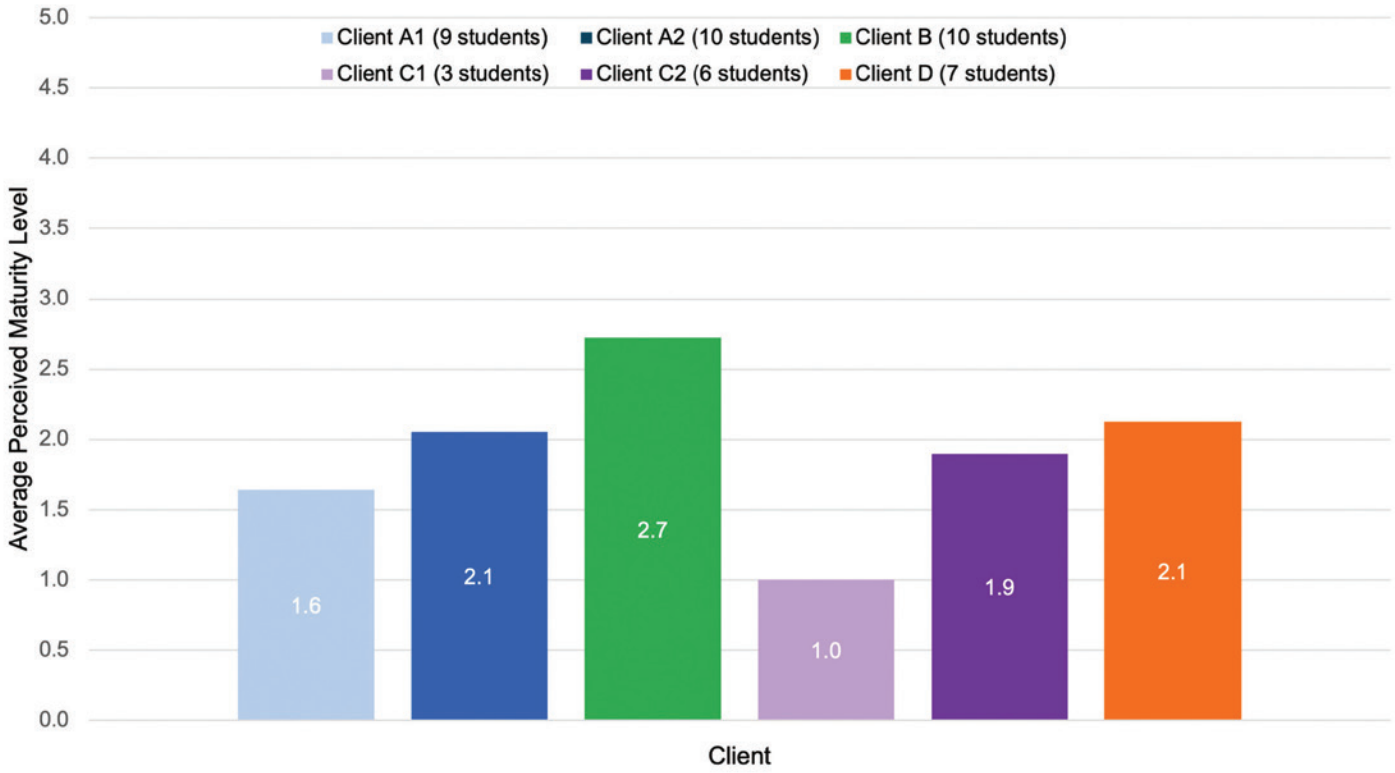

Figure 3. Average Maturity Levels for the Six Clients

of maturity in all models integrate ContentOps and the rest of the organization. For example, Hane et al. (2019b) describe their highest level as "Organizations that are focused on the environment, collaboration, and continually iterating, and are using 14 or more tactics…with greater weight on three tactics: analytics, governance, and content planning calendar…" (p. 10) where "People work together with shared goals, no longer operating in hierarchical organizational silos" (p. 11).

Our results demonstrate that, on average, students judged all clients as relatively immature, with Client B (a B2B software enterprise producing APIs) perceived as the most mature of the six but with an average rating of 2.7, just approaching the midpoint of the scale. Although Client C1 was rated lowest at 1.0, they were judged by only three students, who formed a single team for their content strategy project. The six students who worked with Client C2, however, rated the organization higher at 1.9 but still at a low level of maturity. Client C was a small professional services firm that provided training.

In general, we agree with the student ratings of client maturity. In fact, relatively low levels of maturity appear to be the norm in ContentOps. Research reported by two content strategy consulting groups (Hane et al., 2019b; Jones, 2019) found levels at the midpoint or higher were rare. As Bailie and Urbina wrote, "unless your organization is a newspaper or [has] a business model where producing content is your primary product, there has likely been little impetus to pay much attention to content" (2013, p. 214). This presents a challenge for instructors of content strategy because lower maturity levels mean the client representatives should be less aware of the connection between content and business issues. We did what we could to elicit that information from clients who participated in our requests for existing data and in our questions for client meetings. Not surprisingly, we cannot claim that the client representatives easily met our goal of sharing how they treat content as a business asset. In the analysis of student roadmap reports that follows, we did find some student successes despite our clients' low maturity levels.

Strategic Directions and Tactics in Roadmap Reports

Asking students to select strategic directions and tactics for their clients from the maturity model for content strategy development in the strategic roadmap report allowed us to investigate what and how much students learned about treating content as a business asset. Figure 4 displays the distribution of all strategic directions for the six client projects as selected by the 45 students in their reports.

Quality assurance was the most common strategy selected by students. On the one hand, this result means that students in the course showed significant awareness of the use of style guides as a tactic for content quality assurance (refer to Table 2). All six clients received recommendations to use or improve style guides from a majority of the students who worked with them on a content project. In particular, 15 of the 19 (79%) students working with Clients A1 and A2 recommended assuring content quality with style guides.

On the other hand, style guides do not directly impact the client's business outcomes. One student justified their focus on quality assurance by noting that Client A2 often brings in subject-matter experts (SMEs) to write user guides because the content workload is too great for the two technical writers. The student reasoned that the SMEs need a style guide, along with training, to produce higher-quality content. Unfortunately, we see the most critical business implication as taking SMEs away from the jobs they were hired to do. How much did it cost the company to have these employees create content? Does it make good business/financial sense to have people whose primary job is not technical writing do the writing? The student viewed the situation through a tiny lens of style guides and editing to optimize content quality. This was truly a lost opportunity, signaling the student did not connect their content findings to business causes and effects. Without that insight, the student would be unlikely to function as an effective content leader within an organization.

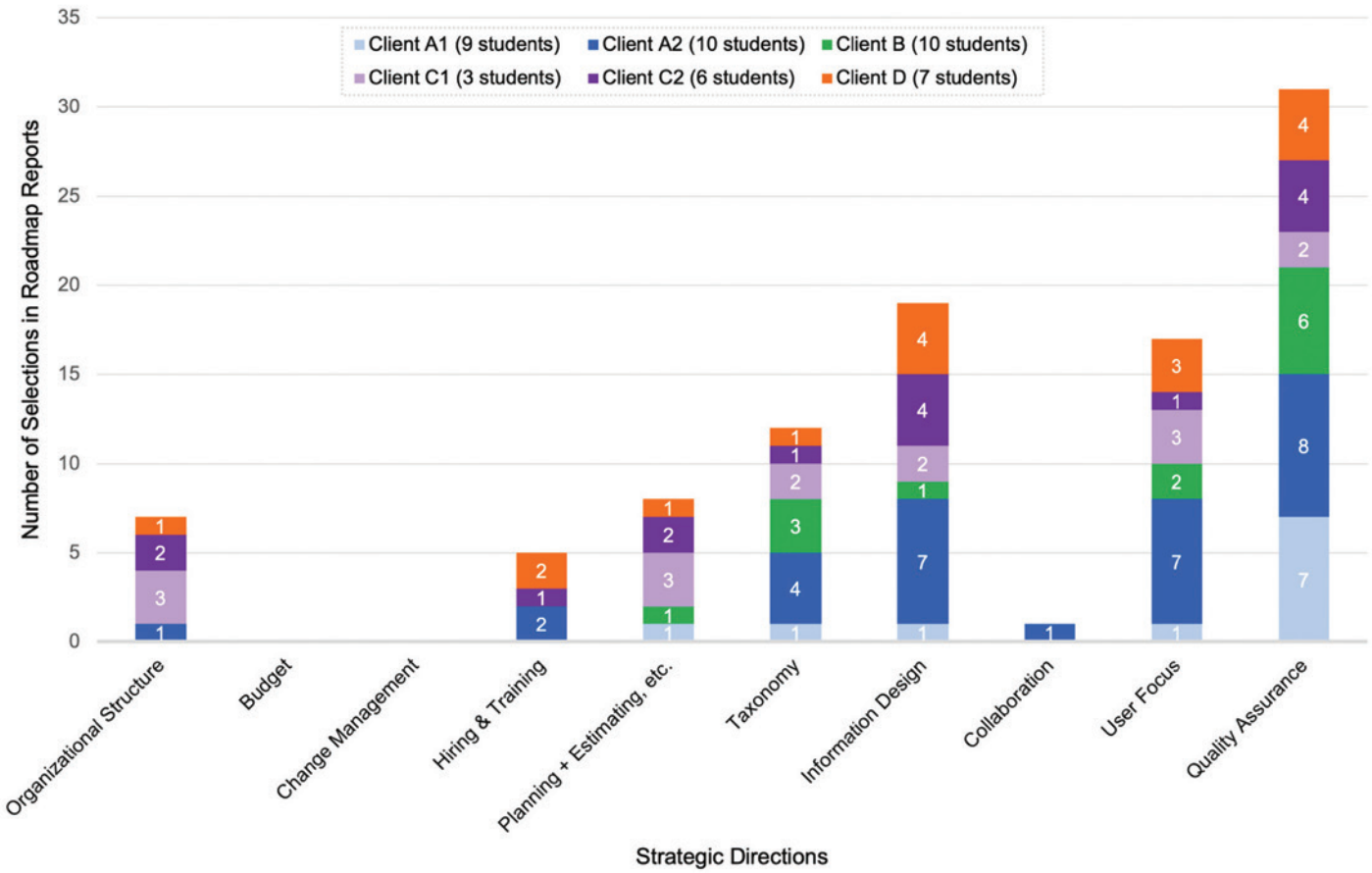

Figure 4. Student Selections of Strategic Directions in Roadmap Reports (see Table 2)

Challenges in Developing Technical Communication Leaders

Information design was the second most common strategy selected by students for their clients. Again, this result means that students in the course recognized its importance in developing a content strategy. Although all six clients received recommendations to follow this strategic direction, Figure 5 shows that most students focused on audience surveys or testing tactics for implementing that strategy while fewer recommended its associated tactics of content models or structured authoring (see Table 2).

As we described above, the strategic directions and tactics in the maturity model for content strategy development vary in the directness with which they connect to business outcomes. The information design strategy impacts content directly but an organization indirectly. Adopting an information design strategy that implements structured authoring demonstrates an unequivocal focus on operational efficiency (Andersen & Batova, 2015; Dayton & Hopper, 2010; Hart-Davidson, 2010; Pullman & Gu, 2007). Students learned about these tactics primarily in Week 6, when tactics were the sole focus of course materials.

To explore an example for Client C2, 4 of the 6 (67%) students working with that client recommended information design as a strategic direction; however, they focused almost exclusively on adopting templates for content types to increase consistency. Only one student specifically suggested structured authoring as a tactic for implementing that strategy. Sadly, they also argued the value of using structured authoring was increased content consistency. No student who worked with Client C2 mentioned structured authoring or content models as a means of increasing business outcomes by cutting business costs through content reuse—despite its pointed emphasis in Week 7 of the course. Yet this is the number one reason organizations adopt it (Rockley & Cooper, 2012; Swisher & Preciado, 2021). This apparent lack of insight would make it difficult to lead a content group effectively within an organization.

We remind readers that all master's and many graduate certificate students in these programs complete a separate digital literacies course in which they create modular content with DITA-like standards and then

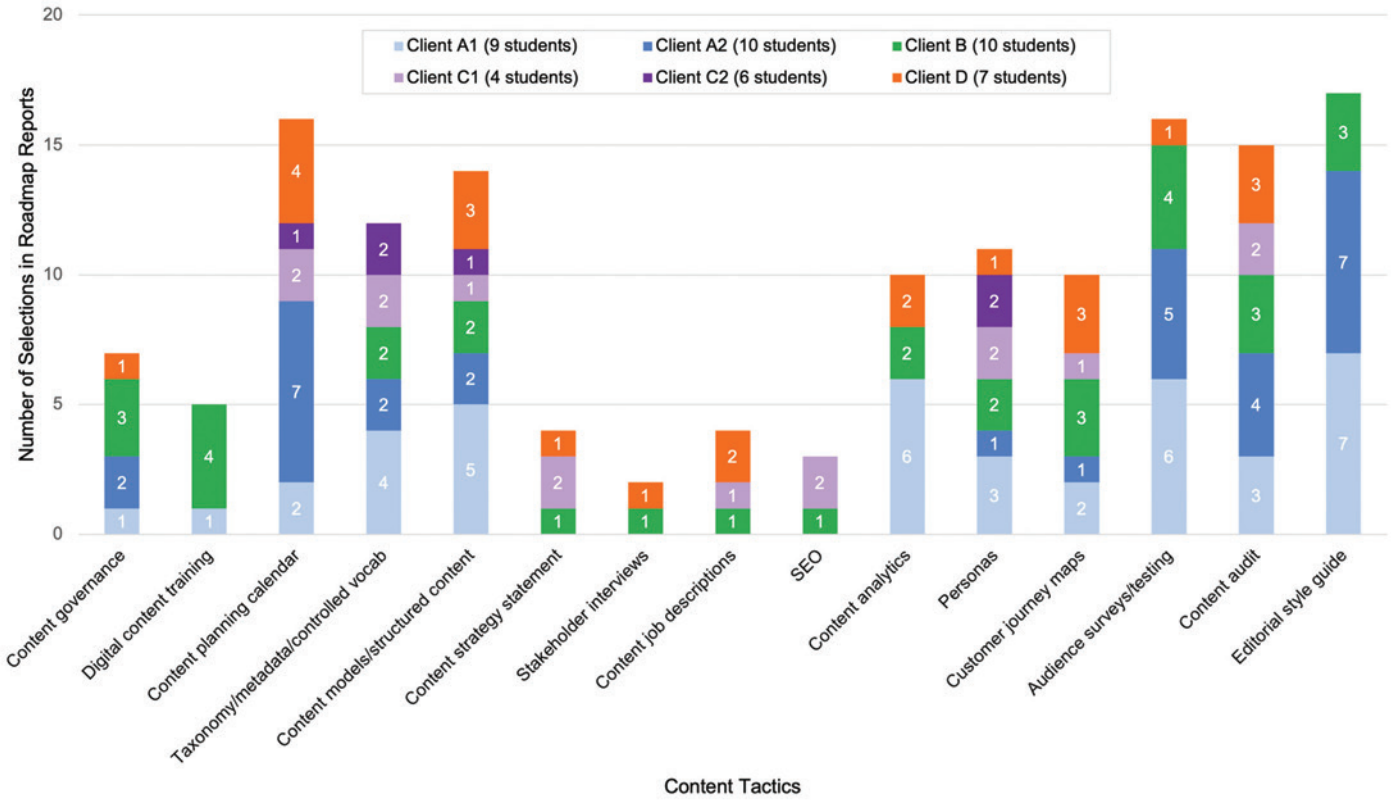

Figure 5. Student Selections of Tactics in Roadmap Reports by Client (see Table 2)

reuse some of it to publish in multiple channels from a single source in a component content management system (CCMS). The content strategy course is intended to focus on why or when—not how—to use content authored and managed as components. Some of the 45 students in the content strategy course had completed the digital literacies course before taking the one in content strategy. Nevertheless, they ignored the business potential of structured authoring for creating efficiency and increasing profits for their client.

The strategic direction of user focus was also a commonly selected strategy of students in their reports. One such student hinted at the business value of Client D's content by stating that more user-focused content, as used by a competitor, could help them attract, satisfy, and retain customers. That student also listed several business-focused questions in the report's conclusion as potential limitations of her recommendations. In this particular case, we might guess the client's low maturity level created an insurmountable obstacle in the form of missing information that prevented this student from fully committing to treating their content as a business asset. However, another student mentioned the potential of increases to Client D's key performance indicator of annual recurring revenue if they embedded a user-feedback option in their published guides. This student clearly and directly connected the strategic direction of user focus to business goals. Thus, we cannot attribute the former student's lapse to the low maturity of their client.

As Figure 4 shows, the tactic of implementing a content planning calendar was a popular choice among students for five of six clients. Most students discussed this tactic as a means of implementing the planning + estimating strategy by removing outdated content to enhance user experience. Again, the student focus was on content quality. However, one student working with Client D mentioned the potential of content planning to support three strategic directions: planning + estimating, collaboration, and organizational structure. (This student was also the only one to present a single tactic as a means of implementing multiple strategic directions.) The student, who connected a content calendar with getting everyone in the organization on the same page for all ContentOps, also mentioning its impact on lifecycle planning, information design, and quality assurance, was exceptionally astute. We are confident this student can lead a content team based on their roadmap report because they connected content with business concerns.

Interestingly, five of the nine students who worked with Client C1 or C2 recommended organizational structure as a strategic direction. We hope the fact that their client was rated as the least mature means they recognized that foundational organizational changes were imperative to address content issues. One student who worked with Client C1 emphasized the tactic of content governance in her discussion of addressing organizational structure, including the need for a single owner of content and a prescribed content lifecycle. Hackos categorized organizational structure as the "first and most pivotal" characteristic of maturity for a technical content team because all other characteristics rely upon it (2007, p. 55). While a few other students mentioned content lifecycles, not one recognized that a content leader was paramount to addressing content issues within that organization. This strategic direction was applicable to most, if not all, of these six clients because of their low maturity levels. A single student demonstrated the ability to recognize organizational structure as the most critical aspect of their recommended content strategy. We should note that a previous analysis of tactic selections by hundreds of professionals revealed no identifiable pattern of adoption based on maturity level (Campbell & Swisher, 2023).

The least recommended strategy was collaboration. A single student presented it as of potential to Client A1. We are somewhat surprised as students regularly expand their thinking about future careers after the content strategy course and have specifically mentioned a newly recognized interest in working across organizational units. We interpret that attitude as highly desirable because Batova (2018) found it was a key motivator for technical writers who successfully managed the adoption of a component content management system in their organization. Recognizing the business value of collaboration is a prerequisite to effective leadership in organizations (Hackos, 2017). Effective collaboration is needed to develop content governance and effective workflows (Swisher & Preciado, 2021).

In general, our students were able to identify issues with technical content quality, and they understood how to address those issues by conducting user tests, implementing a planning calendar, adopting style guides, and so on (Fig. 4). This result is gratifying

but not surprising as most, if not all, of the students' coursework emphasized their future roles as content creators or designers. A few students were also capable of identifying and addressing content management issues and recommending their client become more mature by developing a taxonomy or metadata plan. We consider this encouraging news. The students who recommended such a strategy demonstrated useful knowledge for leading a technical communication team in industry. Overall, however, we are disappointed the students failed to discuss the business causes or effects surrounding the content issues they identified during the project. Instead, they conflated content and process problems. They focused almost exclusively on issues of content quality, usually characterized as a function of consistency, without connecting them to organizational issues. We believe this signals there was limited success in meeting our number one learning goal for students to think about content as a business asset and, thereby, to demonstrate their potential as leaders.

Challenges in the Client-Based Content Strategy Project

In the hope that others can learn from our experience, we present the most challenging issues we faced in teaching content strategy and how we hope to address them in the future.

Challenge 1: Client maturity

Clients might be screened to include only those with information about business pain points related to content or with specific KPIs related to the technical content team's performance. In other words, the instructor might seek only clients with a higher maturity level, which would more likely reinforce the connection between content and its business value. We have limited confidence in this option for improving student learning. Any instructor who implements client-based course projects knows the intricacies and difficulties of client recruitment (Howard, 2020). The relatively low number of sophisticated content teams (Hane et al., 2019a; Jones, 2019) would exacerbate those difficulties. In addition, we found overwhelming evidence that our students were hyper-focused on content problems and missed existing opportunities to connect content and business issues despite low client maturity.

The one immediate change we advocate is revising the detail and order of agendas for client meetings. Clients were directed to discuss their organizational context, including business goals and key performance indicators, in Meeting 2. That agenda can easily be moved to Meeting 4, when students are finalizing their team content assessment and preparing to begin the strategic roadmap report. A revised and expanded agenda for that meeting:

- Explain the organizational context of content creation: Who do you report to within the organization? What type of access do you have to users or customer data? What other units do you regularly interact with? What type of interactions?
- Discuss the business goals that relate to content creation: How is your unit's success measured by the organization? How are individual content creators assessed? Is your unit's success related to business goals or KPIs?
- Answer student questions based on their content assessment, as well as competitor and gap analysis activities.
- Prepare students to move from the audit findings to recommendations.

We have not seriously considered replacing the client-based project because students overwhelmingly want the opportunity to work with real content and the people who create and manage it in organizations. It may be possible to create a simulation that could capture that context; business school instructors appear to be successful at creating such pedagogical tools (e.g., Wharton Interactive at University of Pennsylvania, 2023). However, simulations are rare in technical communication, and publishing one would require determined faculty members with significant expertise and resources.

Challenge 2: Business complexity and instructor knowledge

Every organization represents a unique, complex system within which content is created (Bailie & Urbina, 2013). Complex systems have many dynamic variables that must be untangled to achieve insights because parts of the system display behaviors and characteristics that go beyond what the individual part does on its own (Project Management Institute, 2015). That complexity means even those with extensive business training and experience need help to determine which levers to pull to increase profits, hence, the global growth of the

management consulting industry, whose market size in the U.S. was approximately 329 billion dollars in 2022 (Statista Research Department, 2023).

Business complexity means there is no simple solution for content strategy instructors to supplement their knowledge to teach students to be strategic about content by considering a client's organizational system. We believe collaboration between educators and industry pros is the best option. Our own collaboration has been irreplaceable in the technical communication programs where we teach; it certainly prompted what we have learned and shared in this teaching case. There are others collaborating across the academic and industry split (Albers, 2016; Andersen & Evia, 2019; Evia, 2024). One specific way in which we will emphasize the importance of treating content as a business asset going forward is to add a content strategy consultant presentation meeting to the course schedule in Week 6, as students transition from team content assessment to individual strategic roadmaps in the client project. That virtual meeting will be recorded, so that it can be used by students who cannot attend the live session or who take the course later. In Week 7, we will also add a podcast focused on content strategy return on investment (Kinsey & Pringle, 2019).

Challenge 3: Content strategy and course packaging

We considered course delivery details as potential limitations on student learning. Given the specialized nature of graduate-level education, we think it is reasonable to expect students to engage deeply and effectively with the material and client project in our course within an eight-week period. Real-world parallels reinforce this view; customer analysis projects in professional settings often operate on similar, if not tighter, timeframes and involve a breadth of information gathering and analysis. However, the learning outcomes and project scope within this condensed course structure merit additional examination.

The content strategy course described in this paper purposefully limits itself to the three initial phases of content strategy: students begin in the discovery phase, move on to the gap analysis phase, and finally to the strategic roadmap phase (Bailie & Urbina, 2013). The phases that typically follow are identified for students but otherwise ignored. In industry, the content strategist would focus on the details of implementing the strategy and tactics, measuring their impact, and optimizing results (Nichols, 2015) typically included in ContentOps (Bailie, 2024).

In fact, the first phase (discovery) is key to identifying business problems related to content teams that should guide the development of strategic solutions. Rockley & Cooper (2012) devoted five chapters in their book on content strategy to determining business requirements; before they introduced the content audit as one aspect of discovery, they emphasized the importance of analyzing customer data, identifying business pain points, and understanding the content lifecycle, with its people and processes. This foundational discovery phase might merit a dedicated course to ensure students learn how to view the organizational context within which complex content issues arise.

Although segmenting the content strategy curriculum could provide a more focused and in-depth exploration of the typical strategy development phases, academic realities—staffing availability, faculty subject-matter expertise, availability of clients for projects—must also be considered. Yet, technical communication is known for its interdisciplinarity, and possible curriculum limitations could be addressed by partnering with other departments in other colleges. We suspect that students would be better prepared for an intensive, single eight-week course in content strategy if they had foundational business knowledge, such as financial literacy, organizational behavior, and marketing research. By leveraging the expertise available in business schools, our programs could offer a more thorough education that prepares students to navigate the complexities of content strategy within various organizational contexts. Although prerequisite courses can result in scheduling issues, this is an avenue we will consider going forward.

CONCLUSION

To summarize, we began by documenting the perceived lack of respect expressed by many technical communicators and by arguing that their overall lack of business understanding is a contributing factor and, more importantly, generates a leadership vacuum within the field. Because we believe building a better understanding of content as a business asset is a natural fit within content strategy coursework in technical

communication degree programs, we described how we emphasize it in the course materials for students in our graduate programs. We then reported details for the six client projects completed by 45 students in our content strategy course between 2021–2023. The clients represented diverse organizations with a range of content types that were assessed by students. When interpreting the students' final strategic roadmap reports for the project, we noted one major success: all students were able to identify issues with technical content quality and address them with appropriate tactics (e.g., adopting style guides, creating content models, etc.). Ultimately, we concluded that our goal of preparing technical communicators to be organizational content leaders was unmet. Despite emphasizing the connection between content and business value throughout the course, we found that most students struggled to explicitly link their content strategy recommendations to business outcomes in their final client project reports.

The most recommended strategies from students, quality assurance and information design, focused on increasing content quality. Another commonly recommended strategy, user focus, was rarely connected to business goals. Relatedly, the often-recommended tactic of user testing was treated as a means of implementing the information design strategy by increasing content quality. Another commonly selected tactic, a content planning calendar, was inappropriately discussed as a way to improve content quality by implementing the planning + estimating strategy, which instead focuses on budgets and schedules.

Only a handful of the 45 students explicitly and convincingly connected content issues with business causes or effects. One student recommended implementing user feedback to increase revenue through maintaining customers. A single student recommended the tactic of structured authoring but connected its adoption only to increased content consistency, with no mention of the efficiency inherent in content reuse and reduced business costs. One student recommended a content planning calendar to be strategic about planning + estimating, collaboration, and organizational structure. Of the students who recommended a strategy focused on organizational structure to address governance, only one connected their recommendation to the need for a content champion or leader.

To address some of these challenges, we propose enhancements, such as restructuring client interactions, collaborating with industry experts, refining project deliverables, and potentially integrating foundational business courses into the curriculum. One improvement we can make with little effort is to emphasize to students that the SWOT analysis required in their roadmap reports must focus on the organization (Puyt et al., 2023). The majority of students ignored the fact that their instructional materials explained and demonstrated SWOT as a technique for analyzing organizations. Instead, many attempted to apply SWOT to the content itself, which was universally unsuccessful and probably contributed to their lack of business focus in their strategic directions. In the future, we will make the focus explicit in the assignment instructions, but we will also ask students to submit a draft of their SWOT analysis in their status update due in Week 7. In that way, the instructor can intervene if needed before the student completes their roadmap report.

Future research might explore the effectiveness of these proposed solutions and identify additional strategies for developing technical communication students' business acumen and strategic thinking skills in the context of content strategy coursework. Such research could provide valuable insights into bridging the gap between academia and industry practices.

Our experiences described in this case study certainly underscore the need for closer alignment between technical communication research and industry practices. As Friess and Boettger (2021) reported, there is a disparity between the scholarly focus on rhetorical aspects and practitioners' emphasis on more tangible concerns. However, the trend toward process-oriented research suggests an opportunity for academics to contribute to the growing field of content strategy and address the leadership vacuum identified in our study. In the introduction to his *Technical Communication* special issue on improving research communication, Albers (2016) argued that technical communication had the opportunity to lead on the scholarship in information architecture; however, it ceded that work to library science, which now houses these academic programs. "The train for information architecture has left the station, and we're still on the platform," Albers wrote, "The train for content strategy is loading, and we don't see too many academic researchers with tickets" (Albers, 2016, p. 296).

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SEO as Audience Analysis: Accounting for Algorithms in Content Strategy

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By Daniel L. Hocutt

ABSTRACT

Purpose: This project contributes a rhetorical approach to search engine optimization (SEO) as algorithmic audience analysis. It positions SEO as an activity that requires strategists to compose website content that is optimized to both human search engine users and the algorithmic audience (Gallagher, 2017) of a search engine's indexed content.

Method: Actor-Network Theory (Latour, 2005), with its focus on the agency of non-human entities combined with human agency in social activity, provides the theoretical framework for this approach. The project combines usability testing with web development methods to trace rhetorical agency during online search activities (Hocutt, 2019). Doing so demonstrates the role search algorithms play as receptive audiences of SEO strategies.

Results: Approaches to teaching SEO within the framework of technical and professional communication (TPC) rhetorical foundations require understanding the algorithmic audiences of SEO practices. By matching timestamp data from video-recorded usability tests and HTTP archive (HAR) files produced during usability testing sessions, content strategists can overlay the chronological recordings with their SEO strategies to better understand how successfully SEO met human and algorithmic audience expectations. When SEO practice identifies human audience expectations effectively and develops content signals attractive to its technological audiences, both audiences succeed in an assembled meaning-making exercise. By applying existing methods of audience analysis to search algorithms, content strategists can improve SEO and help surface relevant content for their human users.

Conclusion: The results of this project provide a framework for practicing SEO as rhetorical activity built upon audience analysis of both human and non-human users.

Keywords: Search Engine Optimization (SEO), Audience Analysis, Content Strategy, Algorithmic Audience, Web Content

Practitioner's Takeaway

- Adds SEO as a necessary consideration of content strategy.
- Refines SEO practices to address both human and algorithmic audience requirements.
- Introduces HTTP archive (HAR) files and file readers tools for tracing rhetorical agency across algorithmic audiences.
- Introduces a modified usability study that incorporates web development methods as a novel approach to measuring the effectiveness of content strategy.
- Provides a framework for content strategists to effectively signal search algorithms while meeting human audience expectations.

INTRODUCTION

The purpose of this project is to position search engine optimization (SEO), a process in which web developers and content strategists prepare websites for indexing by search engines like Google, as a kind of audience analysis. To accomplish this, I'll describe audience analysis within the realm of technical communication and describe SEO within the realm of content strategy.

Audience Analysis in Technical and Professional Communication (TPC)

The concept of audience analysis, rooted in the rhetorical situation of audience, rhetor, and purpose, is foundational in TPC theory and practice. Understanding audiences and their goals is the key to content strategy and user experience, ensuring that users are able to solve their problems and achieve their goals. Regardless of the way the rhetorical situation (Biesecker, 1989; Bitzer, 1968; Vatz, 1973) or rhetorical ecology (Edbauer, 2005) is described, tailoring the communication message to an audience remains a fundamental aspect of TPC theory and practice. In TPC research, audience analysis is the subject of numerous studies and theories, most recently focused on the rise of online information in the field. Albers (2003) provides a multidimensional framework for audience analysis when dealing with dynamic information. Miles (2009) addresses audience analysis in an immersive virtual reality (IVR) environment, recognizing the way invention and audience analysis are deeply intertwined when using IVR. Ross (2013) proposes an audience analysis approach to the complex genre ecology of environmental communication, one of several scholars who has recently approached audience analysis for a specific audience. Cardinal (2022) focuses on audience analysis of migrant multilingual audiences using the lens of superdiversity, while Gallagher et al. (2020) introduce big data audience analysis (BDAA) to better understand audience motivations and needs within a massive corpus of online comments. van Velsen et al. (2010) propose user-centered design methods to address increasing personalization in electronic communication; audience analysis for personalization to enable targeted digital microcontent is now commonplace, especially in chatbots and smartphones (Hocutt et al., 2022). Much earlier, Breuch et al. (2001) identified audience analysis as "perhaps the strongest link between usability and technical communication" (p. 227) when encouraging technical communication programs to incorporate usability studies into curricula. Since then, connections among usability, user experience, and technical communication theories and practices centered on audience analysis are regularly reinforced, including in mobile design (Melonçon, 2017), in intercultural and international communication and translation (Jarvis Kwadzo Bokor, 2011; Starke-Meyerring et al., 2007; Yu, 2012), and in curriculum development (St. Amant & Melonçon, 2017) among many other areas of overlap. These approaches to audience analysis are intended to be representative and not exhaustive to demonstrate the wide range of approaches to audience analysis available in technical communication research and practice.

Defining what "audience analysis" means is no less challenging than providing a short review of literature on the concept. The Society for Technical Communication (STC) Body of Knowledge (TCBOK, n.d.) glossary refers "audience analysis" to "user analysis" and defines "user analysis" as follows: "Identification of user requirements for a product. Also called audience analysis." While accurate, the definition feels incomplete given the vast amount of research and theory focused on audience analysis. TPC textbooks offer more robust approaches to audience analysis as a practice. *Technical Communication Across the Professions* (Herald, 2022) recommends that audience analysis determine type of audience; identify background, needs and interests, and other demographic characteristics of the audience; and complicate audience understanding by recognizing more than one audience and wide variability in an audience (Chapter 1.2). In the *Writing Commons*, Hickman (n.d.) describes audience analysis practice as an iterative process throughout composing, focusing on who the audience is and what the audience needs may be. *Open Technical Communication* (Tijerina et al., n.d.) covers many of the same points as Herald (2022) but adds this statement to better illustrate the extent to which analysis should continue: "You've analyzed your audience until you know them better than yourself." For the purposes of this project, audience analysis refers to the process used to adapt content to user needs, focusing on the simpler, but useful, definition provided by the TCBOK.

SEO as Audience Analysis

SEO in Web Development and Marketing

Focusing on search engine optimization (SEO) as a content strategy shifts us squarely into the realm of web development and content writing, often considered more directly aligned to marketing communication than technical communication. As user experience and content strategy become embedded in technical communication courses, theory, and practice (see among others Flanagan et al., 2022; Getto et al., 2020; Getto & Flanagan, 2023; Lauer & Brumberger, 2016; Rose & Schreiber, 2021), SEO becomes an important topic to cover in TPC courses and practice.

According to Semrush, a company focused on online visibility, SEO "is a set of processes aimed at improving a website's visibility in search engines, like Google, with the goal of getting more organic traffic" (Pavlik, 2022). SEO matters, according to industry standard Search Engine Land, because "[t]he better visibility your pages have in search results, the more likely you are to be found and clicked on" (Goodwin, n.d.). It's important to note that SEO isn't restricted to "traditional" search engines like Google and Bing. Search engines can be found in many product and service websites, including Amazon and other online retailers, YouTube and other streaming media providers, and all social media platforms. According to recent research reported in *Insider Intelligence* (2022), shoppers were more likely to start searching for a product using Amazon (63%) than a search engine (49%) based on a survey conducted in September 2022. As a result, content strategists might find themselves developing content and online interfaces for documentation, retail, governmental, or social media platforms. And when they develop content strategies, SEO is likely to be an important aspect of their work.

More specifically, SEO is a process that helps ensure that web content appears at or near the top of search results in a search engine results page (SERP). Analysis of click through rates (CTR) from top search results on SERP to their linked landing pages conducted by Backlinko in May 2023 indicated that ranking number one on a SERP yielded nearly 40% CTR compared to only 18.7% CTR for the second ranking link and 10.2% for the third ranking link (Dean, 2023). The conclusions drawn from this analysis are clearly stated by Pavlik (2022): "The correlation is very simple—**the higher you rank, the more people will visit your page**" (emphasis original). A corollary to this finding is also clear: For content to be accessed, it has to be discoverable through organic search in a search engine. Goodwin (n.d.) reiterates the value of SEO, indicating that the majority of visits to a website, 53%, originate through organic search.

While plenty of scholarship about SEO exists (see for example Confetto & Covucci, 2021; Ibhadode & Opesade, 2022; Schultheiß & Lewandowski, 2021), most studies are necessarily constrained by SEO practices and specific use cases spatially and temporally defined. I'll use Search Engine Land's "Guide to SEO" (Goodwin, n.d.) as an overall primer on SEO practices that apply to this study. In this case, the guide is undated because it's continually updated based on updates to SEO strategies. Goodwin defines three types of SEO: technical, on-site, and off-site. This study focuses on technical and on-site SEO because these aspects can be fully controlled by content strategists. *Technical SEO* focuses on architecture, URL structure, navigation, linking, user experience, structured data, and the hosting and content management platforms in use. *On-site* SEO focuses on content that is easily read and accessed by people and by search engines. Goodwin offers the following useful distinctions between optimizing content for people and for search engines:

When optimizing content for *people*, you should make sure it:

- Covers relevant topics with which you have experience or expertise.
- Includes keywords people would use to find the content.
- Is unique or original.
- Is well-written and free of grammatical and spelling errors.
- Is up-to-date, containing accurate information.
- Includes multimedia (e.g., images, videos).
- Is better than your SERP competitors.
- Is readable—structured to make it easy for people to understand the information you're sharing (think: subheadings, paragraph length, use bolding/italics, ordered/unordered lists, reading level, etc.).

For *search engines*, some key content elements to optimize for are:

- Title tags
- Meta description
- Header tags (H1–H6)
- Image alt text

- Open graph and Twitter Cards metadata

In these lists from Goodwin (n.d.), the connections between audience analysis and SEO begin to emerge. Content strategists should develop content based on audience analysis that is relevant to users, that includes keywords that users would include in a search, and that's readable to users. Content strategists should also develop content that attracts search engines by being "crawlable" (i.e., available to search engine web crawlers that index web content) and easily indexed using structured data and accessible content.

How Online Search Works

A brief discussion of organic online search will help clarify the relationship between content strategy, SEO, and audience analysis. This section describes the online search process by breaking the process into two main visible activities: (1) Entering search terms into a search interface and (2) Receiving the search results. The process by which results emerge from entered search terms is summarized in order to demonstrate the major role that content strategy plays when algorithms match search queries to indexed content toward providing relevant search results.

Preparing for search

Search engines are prepared for organic searches by indexing the content of web pages. The process of collecting and indexing web content is an automated process completed by web crawlers, or spiderbots, that crawl the web to identify new or updated pages; collect information from websites based on content, metadata (title, keywords, descriptions), incoming and outgoing links, and information architecture; and index that information in easily accessible, highly engineered and customized data structures that are quickly accessed during search. Not every website gets indexed, and not all pages are crawled on a website. Indexing involves processing website content into data categories and values based on the structured content of the site. Put another way, algorithmic bots visit crawlable web content to build an index of that content. The bots are programmed to identify certain signals in web content to add to the index. What those signals may be is a trade secret of the indexing search engine corporation (Alphabet, Microsoft, Amazon, Meta, and more). However, each company has its proprietary bots, seeking out signals to index for search.

The search itself

Online search can be broken into a two-pronged, user-initiated process with the following steps:[1]

1. Develop a language query that algorithms can process and match to indexed keywords.
2. Receive relevant search results that seek to meet the needs of the user.

Developing language query. Users initiate online search sessions by typing or vocalizing search terms. Those terms may be single words, phrases, sentences, or questions. Once search terms are entered into a search interface, the algorithmic activity that matches search queries to keywords and identifies matches is largely obscured from view. However, this activity can be broken down into the following processes:

1. Algorithmic collecting and indexing of web content (described above).
2. Transmitting search query from users' devices to search engine servers.
3. Server-based Natural Language Processing (NLP) of search queries.
4. Matching search query with indexed web content.
5. Providing results of the search in SERP.

Viewing search results. The results of algorithmic responses to search are available to researchers in SERP, but the activity of the algorithm itself—the automated, iterative processes by which a search algorithm indexes web content, collects and analyzes search queries, matches queries to indexed keywords, and returns relevance-sorted results to the researchers—is obscured and unavailable for scrutiny and analysis. Most often, algorithmic activities are unavailable because they are proprietary secrets at the heart of a brand.

Where SEO Comes In

This section breaks down specific activities of algorithms involved in online search to reveal how search queries get matched to web results. This description oversimplifies the process, but it seeks to demonstrate the role SEO plays in successful search results.

A simplified method to search engine optimization (SEO) is composing structured content that matches

1 *For a thorough review of these processes, see Hocutt (2019), pp. 14–49.*

the signals that bots are seeking. For example, one widely known signal is nested heading tags (e.g., H1, H2, H3, etc.). Bots are seeking out these content structures to provide context to indexed content. When a page has a single H1 tag that clearly and succinctly identifies the main idea of the content, that tag's content (which appears between the <h1> and </h1> tags in the HTML code) gets indexed as the page's heading. Multiple subheadings, like H2 and H3 headings, are treated in a similar way, except that repeated nested tags under the H1 tag are allowed. If a page has more than one H1 tag, on the other hand, the signal isn't as clear and the bot, programmed to find a single H1 tag on the page, fails to identify the content's main idea.

People and algorithms as audiences

In a nutshell, the difference between a single H1 tag and multiple H1 tags on a web page represents the difference between successful and unsuccessful SEO practice. SEO as a practice is far more complex than focusing on a single signal, but at its heart, the activity of SEO relies on structuring content to match the signals that crawling bots expect to discover. Successful acquisition of signals results in successful indexing, and successful, structured indexing of content results in web content appearing higher in search engine results pages. Phrased in terms of audience, if technical communicators want web content's intended users to find that content using a search engine, then technical communicators must compose and structure content for algorithmic bots and for human users. Content written for users without careful attention to the structured signals that search engines expect will result in useful content that never gets listed among the top results of a search query. For this reason, a theoretical framework that recognizes the agency of online search's human users and algorithmic processes is needed to help outline SEO as a practice that engages human and technological audiences.

Actor-Network Theory as Assembled Rhetorical Agency

One such theoretical framework is Bruno Latour's (2005) Actor-Network Theory (ANT). The ANT framework helps describe the rhetorical activity of search engine optimization (SEO) as the combined agency of content strategists, technologies, human actors, and algorithmic processes. This project focuses on human audiences and non-human algorithms as audiences for SEO practices. By describing these actors as part of an actor-network, content strategy can respond to audience analysis using SEO among its analytical tools.

While Latour's work has regularly been applied to rhetorical studies (see Walsh et al., 2017, for descriptions of Latour's influence), ANT represents a methodology for redefining sociology, not a methodology for tracing rhetorical agency. Latour (2005) describes his project in *Reassembling the Social* as "redefining sociology not as the 'science of the social' but as the *tracing of associations*" and describing the term social as "not a thing among other things…, but a *type of connection* between things that are themselves social" (p. 5, emphasis original). Latour is not presenting a methodological approach to studying the rhetorical activity of humans and technologies in networks. However, ANT provides an approach for identifying actors, defined by Latour as "*any thing* that does modify a state of affairs by making a difference" (p. 71, emphasis original) and tracing their activity, or agency, in relation to other actors in a network. In the case of search, those actors might include web crawling bots, human users, data collections, algorithms, search engines, and content strategists functioning in an actor-network.

Latour's (2005) work seeks to isolate and flatten the activity of network actors like those listed above toward understanding the relations among nodes in networks. The work of isolating actors and flattening networking activity enables tracing social relations among actors, which Latour agrees can be human or nonhuman entities, in order to reveal the social as action and study its emergence. In rhetorical terms, Latour focuses on the agency, or agentive activities, of individual actors toward the emergence of the social in order to demonstrate that social activity represents actors working in differential relation to each other. In writing that "an actor-network is traced whenever, in the course of a study, the decision is made to replace actors of whatever size by local *and* connected sites instead of ranking them into micro and macro" (p. 179, emphasis original), Latour recognizes that both actor and network are essential to the study.

An actor-network represents a combined entity of actor and network that interacts with other actors

and networks whose interaction can be traced and studied toward uncovering the sociology of the social. However, although *actor-network* represents tracing the activity of "local and connected sites" rather than individual actors, it doesn't represent the assemblage of agencies that this project seeks to identify and trace. *Assemblage agency* represents an ecological dependence among constituent entities for activity to emerge. In online research activity, agency is theorized to emerge in collaborative ecological interactivity consisting of human and nonhuman actors, not to emerge through actor-networks centered around human and nonhuman actors. More directly, actor-networks consist of networked connectivities around actors; assemblage agency consists of actors in collaboration whose activity cannot be isolated to individual actor-networks or actors.

SEO IN ACTION

To this point, this project has made the case that content strategists practice audience analysis, and that audience analysis can be related to SEO because content focuses on users, audience analysis focuses on meeting users' needs, and SEO enables users to find relevant content through organic search. It has described the data-driven process by which search engine algorithms match user-generated keywords with indexed web content and has described search engine results pages (SERP) as the location that sorts the resulting web content matches in relevance order. It has made the case that rhetorical agency emerges in the interaction of human and nonhuman actors, and that those actors serve as audiences for which content strategists compose.

We can now take a deeper dive into SEO as an audience-focused process, because the closer the matches between search query (a proxy for user needs) and search results (a proxy for meeting those needs), the more successful SEO strategies are. As Goodwin (n.d.) notes above, good SEO requires technical and content strategies that are optimized to people and search engines. Throughout this section, I'll use "human user" to represent Goodwin's "people," and I'll use "search engine algorithm" or "algorithms" to represent the search engine itself. I focus on "algorithm" because the search engine itself comprises a massive data ecology; the algorithms are the focus of my attention because they serve as the nodal agents that connect user queries with search results through an established procedure.

Search Engine Algorithms as Audience

Both technical SEO and content SEO focus on algorithms as an audience. This section will outline ways that SEO targets algorithmic audiences. Gallager (2017) introduced the term "algorithmic audience" to the field of technical communication "to capture the tension between human and nonhuman factors when writing and producing content for the Web" (p. 26). This project is built around this tension, and SEO is offered as a method to address this tension through audience analysis.

While Google isn't the only search engine, it's the one most commonly used in the U.S. (Statista, 2024a) and worldwide (Statista, 2024b). As a result, understanding how Google describes the action of its algorithms is instructive to understanding the role algorithmic audience analysis may play in SEO. After crawling and indexing content, algorithms seek to provide relevant results to search queries. Google's "How Search Works" online guide describes what algorithmic processes seek to accomplish:

> Google's ranking systems are designed to … sort through hundreds of billions of webpages and other content in our Search index to present the most relevant, useful results in a fraction of a second. […] To give you the most useful information, Search algorithms look at many factors and signals, including the words of your query, relevance and usability of pages, expertise of sources, and your location and settings. ("How Search Works", n.d.)

The "factors and signals" are among the items that content strategists can seek to better understand in order to develop content optimized for the algorithms. While these "factors and signals" aren't public knowledge and differ as proprietary trade secrets among search engines, Google provides a broad outline to help content strategists develop content using both technical and on-site SEO:

- Meaning of query
- Relevance of content
- Quality of content
- Usability of webpages
- Context and settings

SEO as Audience Analysis

While these factors are presented in terms of human users, behind each lies technical and on-site SEO strategies targeting an algorithmic audience.

Meaning of query

For content strategists, human user audience analysis helps identify words and phrases that might be used to describe content. On-site SEO encourages strategists to include keywords and phrases within the content of webpages to ensure that crawling algorithms capture them. While natural language processing (NLP) governs the algorithmic process by which search queries are attributed meaning by search algorithms, keyword and key phrase selection and inclusion in web content ensures that anticipated search terms match content. As importantly, technical SEO encourages strategists to include keywords and key phrases in URL structure, in file names, and in hyperlinks; both technical and on-site SEO focus on including potential query terms in specific areas of structured content, like headings and subheadings, and in page metadata like the <title> attribute. In this signal, predicting what human users might enter as search queries becomes the content that strategists can implement using SEO to meet the expectations of the search engine's algorithmic audience.

Relevance of content

Relevance is a term that relates to both the human user and the algorithm. Relevance of content is determined, at least in part, by the quality of the match between query and indexed content. Again, careful understanding of human users is critical to successfully addressing the expectations of the algorithmic audience. The "How Search Works" guide notes that the "most basic signal that information is relevant is when content contains the same keywords as your search query" (Google, n.d.). Algorithms seek to match search queries with indexed content, and the closer those matches, the more relevant the content is considered. Careful understanding of the keywords that a human user might use to describe content requires human application of human audience analysis along with the SEO strategy of including those keywords in web content.

Quality of content

Content strategists seek to write quality content that is error free and accurate. These are aspects of quality that search engine algorithms seek when indexing content. However, quality is also a factor of trustworthiness of that content. Technical SEO strategies can help boost trustworthiness, like using a domain that matches the information presented (e.g., .gov for government sites; .edu for education sites; .org for organization sites, .com for commerce sites), using a quality domain hosting provider with strong up-time statistics, and using a recognized content management system (CMS) like Joomla, Drupal, or Wordpress with a strong open-source community. On-site SEO techniques to boost quality signals might include consistent site design, accurate breadcrumbs that reflect the navigation structure, and internal links, especially among related subdomains, that connect related content by keywords. In this case, off-site SEO strategies, like a large number of trusted incoming links, become important indicators of quality content. However, external links to trusted sites can also boost the content quality signal. Again, SEO strategies can help boost quality content signals so that pages are indexed and served on SERP as high-quality content. SEO is the strategy by which content strategists can meet the "needs" of algorithmic indexing and matching processes.

Usability of webpages

When addressing this factor in search results, content strategists with UX and technical communication experience excel. For usability, paying careful attention to human user experience is vital to successful SEO. But specific technical and on-site SEO interventions help ensure that usability is recognized by algorithmic audiences. For example, building mobile-friendly, mobile-optimized, and mobile-first website designs is vital to boosting usability. Similarly, page load times and load order are signals that contribute to usability. Here, too, structured content plays a significant role, as navigation, headings, bulleted lists, and chunking make content easier to skim and understand, especially on mobile devices. Implementing plain language principles throughout the site design is an important on-site intervention that can boost the usability of a page. While usability is often focused on human users in technical communication, usability, and user experience design, many of the same design and content principles used for humans also boost usability signals for the algorithmic audience. SEO is a strategy that can help address the human and algorithmic needs

for content that is easy to navigate, simple to use, and effective in solving problems.

Context and settings

Content strategists have less control over factors related to context and setting. In this factor, the algorithm focuses on previous search history and geolocation to help generate relevant results. These factors aren't controlled by content managers, but some technical and on-site SEO strategies can help algorithms identify content that matches context. For example, use of plain language renders content more easily translated to other languages by automated translation programs. Including language metadata clearly identifying content's primary language ensures that search engines can understand and select the correct language context when attempting to translate content into another language. This is especially important if a user has set a preferred language in search settings. Providing clear alternative text to images, structuring tables consistently using accessible design, and consistently structuring content can help algorithms determine if content can be easily accessed by users with accessibility issues, so accessible tools like screen readers, screen magnifiers, and text extractors can be effectively used on the content. Content strategists have less control through SEO over this factor, but select SEO strategies remain useful in ensuring algorithms recognize the content's context and relation to user settings.

Humans as Audiences

Human audiences are most often intended when addressing audience analysis, so no further explanation of audience analysis as it relates to human users is needed. However, there are some aspects of search engine algorithms related to humans that are important to reiterate.

Search engines and their algorithms are the portal through which humans access information in the 21st century. Human users rely on search engine algorithms to match their needs with content and products. As a result, in order for content to be found through organic search, it must appear on some kind of SERP. SEO is the set of practices that content strategists use to connect human users to content, but doing so requires algorithmic intervention. SEO addresses both human users and algorithmic audiences.

Not only must content be listed on SERP, it must appear among top-ranked results. Only about 27% of users who conduct a search using the same query and receiving the same SERP will click on the top link on the page. That's significantly higher than CTR for any link on a subsequent page of results: "only .63% of Google searchers clicked on something from the second page" (Dean, 2023). Searchers typically don't go beyond the top ten search results when seeking a response to a query. If search engines are the portals through which human users access information, and if only the top results on an SERP receive high percentages of clicks, then the importance of content being linked as the most relevant response to a search engine inquiry can't be overstated. SEO is the method content strategists use to increase SERP rankings, a method that's the result of human and algorithmic audience analysis. Almukhtar et al. (2021) echo this conclusion: "Effective SEO means a web page is more likely to appear higher on the results page of a search engine (SERP)… SEO is the process of helping to raise the rank of your website on Google and other search engines, thereby having your website in front of more [human] users." SEO implementation ensures that matches between content strategist keywords and indexed content result in click-throughs from SERP to web content by human users.

TRACING RHETORICAL AGENCY

SEO is offered as a method that requires both human user and algorithmic audience analysis. An SERP presents the results of algorithmic processes that seek to match user inquiries to indexed content, and SEO is used to impact the placement of content links on an SERP. Content strategists can implement SEO to ensure that human users are able to access content, and in doing so, respond to the algorithmic audience that powers search activity and results. The activity of implementing SEO can be described in terms of an assemblage, in which human, technological, and algorithmic agents combine activity to generate meaningful content through algorithm-centered search processes that meet the needs of human users.

The next step to understanding how SEO can be considered audience analysis, addressing both human and algorithmic audiences, is to be able to trace rhetorical activity in real time as it emerges from human and algorithmic activity. Tracing rhetorical activity in

assembled agency through an actor-network offers a number of challenges, but its results are meaningful for (at least) the following reasons:

- Rhetorical agency lies with the rhetor. When the rhetor is assembled in network activity, it's important to understand where human activity ends and technological or algorithmic activity begins.
- Power lies with the rhetorical agent. In the rhetorical situation, rhetorical agency wields power over audiences. Recognizing the sources of rhetorical agency helps trace power as it converges in sociopolitical action. (See Bennett, 2010; Cooper, 2011; Miller, 2007; Walton et al., 2019 for more on rhetorical agency and power structures.)
- Algorithmic audiences are black-boxed. We just don't know many particulars about how search algorithms identify signals and order results by relevance on SERP. Knowing how to trace network activity to and from search engines via algorithmic processes helps us better understand the value of SEO as algorithmic audience analysis.

The Approach

Tracing rhetorical activity during online search helps us better understand how algorithms match user-generated keywords to algorithm-indexed content. By combining the results of traditional usability testing of an online search session with a technical record of network activity of that same session, students can isolate the give and take of rhetorical agency during the search session (Hocutt, 2019). More specifically, content strategists can identify moments when algorithms match keywords to indexed content and recognize how those matches produce SERPs from those matches. This provides insight into SEO practices that can help strengthen those matches.

Tracing human activities

To trace human activities during a search session scenario, a researcher can employ usability testing software to record cursor, keyboard, and mouse activity, along with a video record of research activities, and ask the user to practice speak-aloud protocol to collect their own narrative of research activity. The scenario of the usability test can start with a prompt (e.g., "think of a topic you want to know more about and conduct an online search using a search engine to find a page that addresses your search query") to conduct a search and end when the user clicks through the SERP to a meaningful result. This recording provides a timestamped trace of participant activity that can be transcribed and related to network activity happening throughout the search session.

To supplement this collection of data, an ethnographic observer can collect descriptive field notes during the search session, focusing on actions taken by participants in relation to their devices (mobile, desktop, laptop) and their browser technology and search habits. The following are recommended areas to observe during the search session.

- Network speed during session (using a tool like SpeedTest by Ookla [https://speedtest.net])
- Environmental conditions during session (temperature, lighting, cleanliness, orderliness, seating area, comfort)
- Participant appearance and unrecorded actions during session (arrival timeliness, comfort with search, questions asked, willingness to participate, apparent search literacy)
- Technology used during session (device make and model, other technologies running in the background, ad blockers and other mediating apps in use and/or deactivated for the session)

For additional context, a post-search-session survey can ask the user to record any additional detail about their intentions, state of mind, and approach to the search session. Questions to include on the survey might include the following:

- Have you used the search tool used in the search scenario before this activity? If so, characterize your level of experience with this search tool (novice, intermediate, expert).
- Describe the environment in which you are conducting this activity. Be as descriptive as possible; complete sentences are not required.
- Were you logged in to a search or social media account(s) while using your browser to complete this activity?
- Summarize the research assignment or project you used to complete this usability test. Provide as much detail as possible.

When combined with the transcribed, timestamped record of the search session (including

talk-aloud protocol) and the descriptive notes taken during the session, a portrait of the human user's meaning-making rhetorical activities is available for examination and correlation with the network activities collected in the next step.

Tracing network activities

To trace the activity of networks, including algorithmic processes occurring during the search session, a web browser's development tools can be used. During the recorded usability test, developer tools can be opened in the browser (all modern web browsers include developer tools) and network activity can be recorded. As the user completes the usability testing scenario, network activity is recorded, including network assets downloaded, cookies written to the browser, data collected from servers, data sent via tracking pixels to servers, search queries submitted, and search results returned. Upon completion of the search scenario and concluding the usability test recording, the network activity captured using developer tools can be downloaded as HTTP archive (HAR) files, which are multidimensional JSON objects that can be visualized using a HAR visualizer. Using a HAR visualizer, the network data can be traced chronologically using timestamps.

A sample visualization of a HAR file of a search session (see Fig. 1) contains a record of all network traffic and its content loaded when a search interface page loads. For each network asset loaded, the following details are recorded: its URL, its load status, its load timing relative to other assets on the page, and its timestamp. Additionally, for each asset, the information requested, the response and its content received, any cookies sent or received, and the amount of time the asset took to be sent and received are also collected.

In Figure 1, a Facebook Javascript asset row ("https://connect.facebook.net/en_US/all.js") is highlighted at timestamp 17:46:27.068 (hh:mm:ss:mss UTC), showing the timestamp and the waterfall asset load time. In the detail to the right of the figure are tabs containing the information sent and received by the selected asset in the server **request** (contents visible in Fig. 1), the server **response**, the response **content**, any **cookies** sent and/or received with the request, and a labeled asset load **timeline** broken into segments. A detail of the **timeline** appears in Figure 2, measured in milliseconds (ms).

The timestamped network activity contained in the HAR files can be transcribed and associated with the timestamped transcription of the recorded search session. The resulting spreadsheet provides a complete, timestamped report of user and network activities, accurate to the millisecond, as human and algorithmic actors interact to create meaning in the

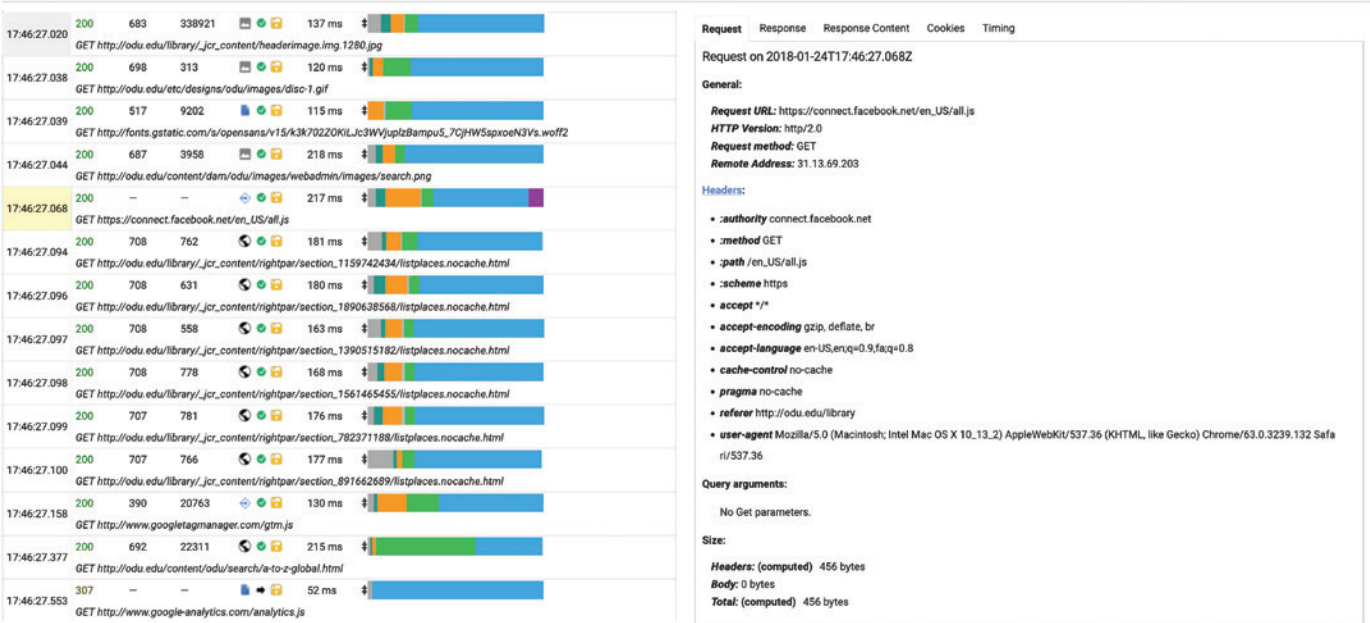

Figure 1: Portion of a HAR file visualization report for a library search page.

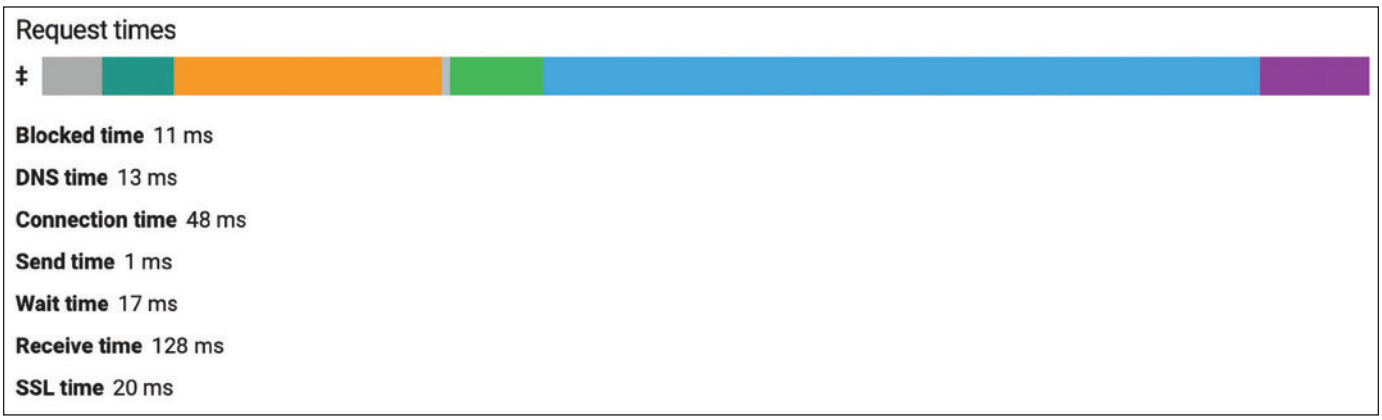

Figure 2: Timing tab detail in the HAR file visualization shown in Fig. 1.

form of the SERP and a search result selected by the participant. A sample CSV file showing the format of such a combined timeline available for download at danielhocutt.com/posthumanagency. Its headings are as follows (see Table 1):

- Usability Test Elapsed Time
- HAR Timestamp
- Activity
- Comment

Assembled rhetorical agency

By matching timestamps from the usability test recording and the HAR files, a clear, chronological picture of rhetorical agency emerging during search activity emerges where human action in the form of entering search queries, reviewing SERP, and clicking through to relevant search results can be placed in chronological order, often to the millisecond, with network activities in the form of downloaded webpage assets; uploaded data from queries and from algorithmic activities like tracking pixels; downloaded SERP components; and uploaded and downloaded network calls that result for clicking through to a relevant result. Preparing data for analysis in this way is meticulous and time consuming, but the reward is the ability to point directly to specific SEO actions that result in relevant search results. Below I briefly illustrate how SEO techniques are recorded in tracing rhetorical agency using these methods.

- The usability test transcript can specify the goal of entering a specific search query, helping the researcher understand keyword selection. These can then be matched to the keywords used by the content strategist in building web content.
- The terms entered get captured and transmitted to the search engine's server, which can be viewed in the network activity. Additional data transmitted to the server includes browser settings, browsing history, tracking pixel data, and cookie data, all used to provide context to the algorithm as it connects search queries to indexed data.
- The SERP components including relevant results get downloaded via HTML and written to the browser, revealing the way query keywords get matched to indexed content and returned in response to the search query.
- The SERP can be viewed in the usability test recording to reveal all the results the search engine generated in response to the search query. Viewing the full list of returned results in the SERP can provide insight into relevance sorting, a response to successful SEO practices.
- The usability recording and post-session survey can provide the user's rationale for either revising the search in response to irrelevant results or for selecting a relevant result. In both cases, insights into the way users determine relevance among search results can help content strategists hone their content for SEO.

A truncated example of the CSV datafile referenced above is shown in Table 1. It identifies user activity and browser and network activity while searching.

Although severely truncated (the entire dataset consists of 653 rows and spans an elapsed usability testing time of 13 minutes, 30 seconds), the data in Table 1 approximates the interplay of rhetorical agency among the search user and the browser. Rows

Table 1: Abridged data table showing user and browser activity during observed search session.

UT Elapsed Time *mm:ss:ms*	HAR Timestamp *hh:mm:ss:mss*	Activity	Comment
00:00:00		Start of usability test (UT)	UT recording begins
00:49:00	17:46:26.645	Participant opens search page	Initiates browser search session
	17:46:26.681 to 17:46:28.461	60 network calls sent and received from participant's browser	Search interface page loads in browser
00:02:11 to 00:03:49		Participant reads instructions from UT	Initial speak-aloud participant responses
00:04:22		Participants begins describing research question for search	Speak-aloud protocol outlines participant's search approach
00:04:57	17:50:53.967	Participant initiates first search string	Participant enters search string into interface and starts search
	17:50:54.470 to 17:51:20.684	66 network calls sent and received from participant's browser	Query submitted and SERP loads in browser
00:05:21		Participant begins reviewing search results	Participant reviews SERP page

containing only *UT Elapsed Time* values represent *user agency*, rows containing only *HAR Timestamp* values represent *technological agency*, and rows containing both *UT Elapsed Time* and *HAR Timestamp* values represent *assembled rhetorical agency* among search user and browser. I've intentionally used the term "among" rather than "between" with the pair *user* and *browser*. *User* represents an entire ecology of literacies, experiences, knowledge, and environmental factors surrounding them, while the browser represents an entire ecology of data sources, algorithmic processes, machine learning, artificial intelligence, network actions, and technical protocols supporting it. This is the actor-network that assembles around search and its results.

Connecting Agency Tracing to SEO

When provided with this tracing of rhetorical agency, content strategists can overlay the chronological recordings with their SEO strategies to better understand how successfully SEO met human and algorithmic audience expectations. For example, a user who repeatedly revises search queries to generate a new SERP with fresh results may be using queries with keywords that SEO didn't predict and therefore didn't include in crawled content. Or the relevant content may exist on a website, but its infrastructural elements may lack technical SEO execution and result in poor SEO, content un-crawled and un-indexed despite being relevant.

In the method described above, the user ecology captured while conducting a recorded usability test provides insight into the user's approach to the search task. Data collected during the test may identify relevant details about the user-as-audience and their background, algorithmic literacy, and knowledge of the topic. For example, a user researching a historical event without adequate knowledge of the event's causes and background may enter keywords in their queries that are broader than the keywords embedded in the content through SEO processes. While SEO as audience analysis can't anticipate every human audience's background and literacy, the method outlined above can help practitioners expand or adapt their SEO practices to meet those human audience needs.

Similarly, the technological ecology captured using browser developer tools provides insight into the technological audience's approach to search. Data collected during the test may identify relevant details about the network calls and responses, the data passing between the browser and server, and the timeframe in which responses are generated. For example, the developer tools may identify network calls that are unanswered and generate time-out errors, or the tools may identify specific networks whose calls and responses lag behind other networks. Technological audiences benefit from strong SEO practices like ensuring load times are within mobile browsing parameters, and the methods outlined above can help practitioners expand or adapt their SEO practices to meet those technological audience needs.

And finally, the assembled agency surrounding the combined activity of human user and technological user that is captured in the merged timestamped file in this method offers unique insight into the role SEO plays in the overall search experience. Without the interplay among users entering queries and algorithms responding to those queries with relevant content, content strategists miss seeing the results of their SEO practices. When SEO practice identifies human audience expectations effectively and develops content signals attractive to its technological audiences, both audiences succeed in an assembled meaning-making exercise. Success may be revealed in brief search sessions that result in relevant content provided quickly by means of technological agency matching human agency, made possible through SEO as a technique for assembled audience analysis.

These methods, a hybrid combination of rhetorical usability studies and web development methods, emphasize the importance of understanding how web content is indexed and matched to user-entered queries. Understanding this matching process requires audience analysis of the indexing bots and algorithms. As a result, approaches to teaching SEO within the framework of TPC's rhetorical foundations require understanding the algorithmic audiences of SEO practices. By applying existing methods of audience analysis to search algorithms, content strategists can improve SEO and help surface relevant content for their human users.

FRAMEWORK FOR USING SEO AS AUDIENCE ANALYSIS

The goal of this project has been to reveal to content strategists, along with UX and TPC researchers and teachers, the value of SEO as an audience analysis technique for both human and algorithmic audiences. While SEO isn't directly related to audiences, its success is the difference between algorithmic and human users accessing or missing relevant search results that meet their expectations. Human audiences expect information that addresses their queries, while algorithmic audiences expect signals for indexing and matching content.

A relatively simple framework for SEO as audience analysis might start by focusing on each audience separately. Search engines use algorithms to crawl and index (and iteratively re-crawl and re-index) web content in search of specific signals. These signals, as described above, are boosted by SEO techniques, effectively "attracting" algorithms as assembled technological audiences to crawl and index well-structured content composed using meaningful keywords. Search engines respond to human user queries by attempting to match query keywords to indexed keywords, then structure content on SERP for usability and provide relevant results for click through. The relevance of search results is boosted by SEO techniques, effectively "attracting" human users as audiences to search for information and select relevant results. The common element in both algorithm-focused and human-focused processes is SEO, which works best when both audiences are carefully analyzed and addressed. While there are hundreds, perhaps thousands, of technical and on-site SEO techniques, one of the core strategies behind effective SEO is keyword selection and inclusion.

In response, I offer the following as a simplified approach to understanding SEO as audience analysis. While steps 1–3 are commonly used in TPC and UX praxis, step 4 offers an additional step to determine whether intended audiences are assembling around queries and SERP.

1. Identify keywords that a human audience might use to describe content.
    a. Conduct a careful human audience analysis, using the strategies outlined throughout the UX, TPC, and content strategy fields.
    b. Consider the complexities of human audiences, including their level of expertise, their knowledge of the subject, and the likelihood that multiple audiences will encounter this content for varying purposes.
    c. Develop an exhaustive list of keywords that predicts the variety of approaches that audiences will use to describe the content.
2. Use technical and on-site SEO practices to incorporate keywords into content.
    a. Confirm that content is fully crawlable and meets relevance, quality, and usability factors.
    b. Include keywords in site infrastructure, including folder names, file names, and navigation text throughout the site.
    c. Include keywords in structured content, confirming their appropriate use in

headings, subheadings, bulleted lists, and chunked content.

3. Determine the effectiveness of SEO as audience analysis.
   a. Give search engine algorithms adequate time to crawl or re-crawl content.
   b. Conduct searches using multiple user profiles and keywords identified in step 1.
   c. Analyze SERP to determine if the content you've built appears in top search results.
4. Take a sample query and trace rhetorical agency through the search process using the method described above.
   a. Visualize the effectiveness (or ineffectiveness) of SEO in matching human and algorithmic audience expectations to content.
   b. Focus on whether multiple searches need to be conducted to yield expected results.
   c. Troubleshoot problem areas if they exist.

CONCLUSION

This project aimed to present search engine optimization (SEO) as a method for audience analysis that can be applied to both human audiences and algorithmic audiences through the activity of online search using a search engine. To do so, it presented SEO as a rhetorical activity that addressed human and algorithmic audiences. It continued by describing the rhetorical agency of SEO as an actor-network consisting of assembled human, technological, and algorithmic actors combining efforts to deliver relevant content in response to online search. The project then focused on SEO techniques, demonstrating how these techniques meet the needs of both human and algorithmic audiences. It offered a method for tracing rhetorical agency through online search, and of connecting specific sections of that tracing activity to SEO techniques. It concluded with a basic framework for content strategists to use SEO as audience analysis through keyword development that persists during web content development and deployment.

Online search is built upon content. Successful online search, measured by the delivery of the most relevant responses as quickly as possible, depends on SEO. Successful SEO requires understanding human audience needs and search algorithm expectations. The combined, assembled rhetorical agency that emerges from an online search session requires understanding the rhetorical situation as an actor-network, combining the activities of human, technological, and algorithmic agents to deliver relevant results. SEO, along with methods of tracing rhetorical agency, can provide content strategists with important analysis techniques that apply across human and algorithmic audiences.

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Incorporating Human Judgment in AI-Assisted Content Development: The HEAT Heuristic

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ABSTRACT

Purpose: As technical and professional communicators (TPCs) use AI to develop content, inaccuracies due to AI limitations are introduced; it is vital TPCs evaluate AI-generated content to improve accuracy and human-centeredness. In this article, we present a human-in-the-loop AI content heuristic (HEAT: Human experience, Expertise, Accuracy, and Trust) as a rating mechanism.

Method: This exploratory case study evaluated the quality of content generated by ChatGPT from the perspective of beginner TPC students. We used multiple prompting strategies asking ChatGPT to create documentation on personas using two Darwin Information Type Architecture (DITA) information types namely, concept topics and task instructions, and we evaluated the results with HEAT.

Results: HEAT had good intraclass correlation coefficient (ICC) reliability (.743 pilot; .825 for scenarios) indicating its fitness as a heuristic for evaluating generative AI output. The findings indicate that ChatGPT was generally good at writing concept topics; however, it performed less well creating step-by-step task instructions. Expert TPC input helped develop a better prompt for improved output. We also found that tokenization in ChatGPT (the way it breaks up text) has a large role in terms of non-compliance with format specifications.

Conclusion: There is a need for TPCs to (1) develop new models for AI-assisted content creation, (2) recognize the impact of different prompting strategies on developing specific structured authoring units such as concept and task topics, and (3) be aware of the limitations of AI such as ChatGPT. Human-in-the-loop quality check mechanisms, such as HEAT, can help validate and modify AI-generated content to better serve end users.

Keywords: Generative Artificial Intelligence, Content Development, Case Study, UX

Practitioner's Takeaway:

- TPCs can use the HEAT model to check AI-assisted content quality.
- Different prompting strategies and roles for AI in generating output may foster new co-creation models.
- Expert intervention is necessary: ChatGPT performed well on specific structured authoring information units for developing conceptual information (e.g., concept topics) but performed poorly on writing step-by-step instructions (e.g., task topics).
- TPCs are still needed to write quality prompts and assess AI output. We found that AI generated better output when prompts were written by an expert.

INTRODUCTION

In the case of artificial intelligence (AI), the saying *things move so fast in the digital world that one internet year is equivalent to three months* has merit. In May, the *2023 State of User Research Report* stated that 20% of researchers reported using AI in their work (Balboni et al., 2023, n.p.). Three months later, a follow-up survey of 1,093 researchers showed that number had jumped to 77.1%. In a March 2024 *UX Writing Hub* workshop, content designer/UX writer Andrew Stein noted how AI asks technical writers to show up differently in workplaces and suggested adopting the title *AI Content Lead*. Additionally, Stein stated that the proliferation of AI content development practices caused the freelance platform Upwork to drastically decrease requests for freelance writers. Although growth in the number of technical and professional communicators (TPCs) using AI in the workplace is high, there is considerable anecdotal evidence that users' confidence in AI-generated content is low. Ethical concerns abound about Generative AI (genAI) Large Language Models' (LLMs) lack of consistency and sometimes fabricated answers (so-called AI hallucinations).

The work of TPCs is 100% impacted if companies outsource work to only a few content developers who oversee content generated by AI for end users (Eloundou et al., 2023). If AI's speed is equated with efficiency, companies run the risk of neglecting content quality issues related to human experience, writer expertise, information accuracy, and human trust. For example, poorly developed chatbots have caused major legal and financial headaches for Air Canada and Google by fabricating non-existent customer policies or inaccurate information (Milmo & Wearden, 2023; Price, 2022). Hence, TPCs must advocate for human input as companies try to automate AI content development.

Since AI can generate and analyze text, recommend ideas, identify user sentiments, develop interface prototypes, and create user personas from scratch, we can expect the integration of AI in various stages of content creation. Given fast-moving industry developments in AI, it is critical we assess how it can help develop content at various stages (see Duin & Pedersen, 2021, 2023; Tham et al., 2022; Verhulsdonck et al., 2021). Research on the role of content strategy has already signaled changes in TPC workflows through reduced time spent on brainstorming and drafting, freeing up more time for creative, higher-level endeavors (Bridgeford, 2020; Getto et al., 2019, 2023; Nielsen, 2023; Noy & Zhang, 2023). According to Graham (2023), instructors must advocate for post-process writing practices and help students learn "prompt-engineering, output curation, fact-checking, and revision" while writing with AI in a recursive manner (p. 166). Expanding on this, Knowles (2024) recommended that we avoid "offloading the entire rhetorical load to AI" and instead rely on human writers with augmentation by AI (p. 3). Hence, whether content works for users depends on developing robust AI-TPC content co-creation practices. Such practices require TPCs to understand how to incorporate human experience and writer content expertise, as well as assure AI content is accurate and can be trusted by users. Further, as TPCs are attuned to ethical issues, bias, user advocacy, and social justice (Jones, 2016; Rose & Walton, 2018), it is vital for TPCs to check the work of genAI to better address diverse end users.

Because TPCs may not be aware of genAI limits, it is paramount that our field establishes appropriate reliance on genAI and develops workable models for AI content co-creation. In this article, we present a human-in-the-loop heuristic, HEAT (Human experience, Expertise, Accuracy, and Trust), for rating genAI output quality, which asks TPCs to check how genAI content maps onto the physical world of the user (Human experience), to use mental models and schemas to help the user (Expertise), and to confirm the output is accurate (Accuracy) and trustworthy (Trust).

In what follows, we outline literature on LLMs and their limitations, highlighting the need for trustworthy and ethical AI. We describe a theoretical framework for checking AI output that acknowledges these shortcomings, followed by a description of our methods, prompt design, use of ChatGPT, and use of the HEAT heuristic. In our Results and Discussion section, we demonstrate how ChatGPT was better at developing concept information than writing task instructions. We conclude with takeaways for TPCs on using genAI for content co-creation.

LITERATURE REVIEW

While many companies dream of automating their writing workflow through AI (Barker, 2021), it remains a far-off scenario. AI's speed cannot replace a human

writer's attunement to human experience or expertise if the AI does not recognize the physical context of its content or whether its output is hallucinated. However, we believe AI can play a collaborative role with TPCs through human-machine teaming (Duin & Pedersen, 2021, 2023). According to content strategist Robert Rose, content generation "is the least interesting thing that ChatGPT and other generative AI tools do" (Fisher, 2023, n.p.). For example, genAI can engage in *role-playing* by taking on a specific *role* in content development ("acting as a UX researcher, identify top ten pain points in the user comments provided") or *persona* ("acting in the role of persona Susan, analyze this interface for pains and gains") in quickly analyzing and generating input. GenAI can also function as a brainstorming partner, content re-organizer/extractor, copy rejuvenator, and sentiment/data analyst (Fisher, 2023). Therefore, it is crucial to recognize how genAI will alter existing TPC content development processes.

It is vital to address the emergent properties of LLMs and to understand that while we were writing this article, newer, faster, and more improved versions of AI were emerging. Our goal here is to inform a critical perspective for TPCs. While LLMs have the capacity for *autopoiesis* and *emergent behavior*—e.g., continuous self-organizing as they learn from users—LLMs cannot adequately address all user contexts. For example, a review of common ChatGPT errors mentions its lack of addressing real-world physical dimensions, errors in math, and difficulty dealing with ethics, human bias, and human reasoning (Borji, 2023).

Current genAI is not foolproof as LLMs fabricate convincing sounding but incorrect content (so-called hallucinations). GenAI such as ChatGPT are trained on *Common Crawl*—a dataset of roughly 570 gigabytes as of this writing, consisting of Wikipedia data, outbound links from Reddit, and an unknown number of published books (Bender et al., 2021). Therefore, AI researchers warn that LLMs are problematic "stochastic parrots" that reinforce harmful stereotypes, have biases in content, and create potential for misuse (Bender et al., 2021, p. 616). For example, poor AI model training on bank loans based only on upper- and middle-class customer data may erroneously deny low-income households. As AI theorist Luciano Floridi (2023) noted, LLMs liberate "agency from intelligence" where AI *acts* like it has understood you but does not *understand* what it has generated (p. 16). Combined with LLM issues of copyright violations; the human cost of contractors labeling harmful content in Kenya for less than $2 per hour; algorithmic poisoning impacting crucial financial, medical, or other important human decisions; it is clear that automating all content is not the answer (Floridi, 2023). Hence, a wicked problem exists: genAI LLMs can generate convincing output that is biased, incorrect, or not rooted in reality. These issues are crucial for TPCs to identify and may negatively affect assessments of genAI content automation.

While LLMs display emergent behavior, researchers are mixed in their assessment on how LLMs may overcome the above issues. Increasing the amount of training data for an LLM creates more hallucinations because of the larger dataset (Lin et al., 2021). Also, model deterioration of LLMs may occur if future LLMs are trained on hallucinated, factually incorrect AI-generated content together with human-generated content (Shumailov et al., 2023). Since LLMs use machine learning techniques to reward better answers, an intractable issue exists as algorithmic reinforcement relies on the quality of prompts provided by human users. Hence, researchers propose *instruction tuning* by feeding LLM supervised learning tasks that help train AI to create better output (Christiano et al., 2017; Touvron et al., 2023; Wei et al., 2021). *Chain-of-thought* prompting—where a prompt writer makes explicit their reasoning, provides an example of desired output, and gives crucial context for reasoning in the prompt—can also increase the effectiveness of LLMs in producing higher quality desired output (Wang et al., 2022; Wei et al., 2022). Meanwhile, complete automation of content creation is not yet feasible; quality content development requires understanding the context, structure, and user needs, as well as writing a strong prompt and carefully evaluating output—skills that TPCs bring to content development processes.

Human-in-the-Loop: Need for Human Judgment

While automation of content may be seen as a means of better efficiency, it is vital that TPCs recognize that "instead of thinking of automation as the *removal* of human involvement from a task, [it is actually] … the *selective* inclusion of human participation" (Wang, 2019, n.p.). We argue that a human-in-the-loop perspective includes incorporating human input and judgment to assess and modify AI-generated content toward nuance and quality.

As there is a perceived bias, lack of transparency, and accountability in AI training models, calls for more human-in-the-loop, ethical standards abound (Brundage et al., 2020; Noble, 2018; World Economic Forum, 2022). Researchers call for more "human-centered," "ethical," "explainable," "responsible" AI based on equity and inclusion of diverse human perspectives (Verhulsdonck et al., 2021; World Economic Forum, 2022). Given the nature of TPC work in inferring the total experiences (emotions, pains, and gains) of users and their physical surroundings in a dynamic context, it is crucial to build in human-in-the-loop mechanisms to check AI content for human-centeredness and accuracy to safeguard users.

THEORETICAL FRAMEWORK: ADDRESSING HOW WE JUDGE AI OUTPUT

Important moments in human creativity are at the *beginning* (generating ideas) and *ending* (evaluating where something works or is desirable to implement) of a process. With AI, that means writing strong prompts and evaluating output. However, human creativity is not just about idea generation (something genAI can do). Humans also exercise *judgment*: *applying* ideas to new contexts, *identifying* problems worthy of problem-solving, and *evaluating the effectiveness* of a particular course of action (Csikszentmihalyi, 1988; Vinchon et al., 2023). Such creative endeavors are central to many TPC activities in addressing end users and their physical contexts and reinforce that AI content still needs to be evaluated and refined to better work for human ends.

When working with AI, human judgment is impacted by two human factors: AI literacy and cognitive biases. Passi and Vorvoreanu (2021) identified that differences in people's AI literacy—their *level of expertise*, *task familiarity,* and *prior exposure* to AI—influences whether they see AI output as trustworthy. Additionally, cognitive biases such as *confirmation* or *automation bias* may lead people to wrongly deem AI output correct if it confirms their initial idea or is automated (Passi & Vorvoreanu, 2021). Hence, researchers warn people not to over-rely on AI output without incorporating their own critical judgment. For example, a study of medical professionals found that both low- and high-expertise groups developed high dependency on AI recommendation systems (Gaube et al., 2021). Other AI studies also show that perceived mismatch between expected answer and generated AI output may lead people to change their answer to align with AI (Kim et al., 2021; Springer et al., 2017). In response, researchers in AI trust and accountability emphasize the critical need for contextualizing the quality of AI output to support better human judgments and reduce overreliance on AI (Springer & Whittaker, 2020).

HEAT Model

It is important for TPCs to understand what genAI *can* and *cannot* effectively do. Given that LLMs cannot always overtly address specific physical human experiences, it is vital TPCs check for this. Likewise, since LLMs do not always incorporate human nuance, TPCs need to bring their writing expertise. Further, due to LLMs hallucinating incorrect content or generating biased output, it is vital TPCs ensure accuracy and foster trust for users. Our HEAT model is based on developing such human-in-the-loop perspectives, asking TPCs to use four elements—human experience, expertise, accuracy, and trust—to evaluate genAI output (refer to Table 1).

Table 1. The HEAT model and application

Category	What it means	Score Not present = 0, Present = 1, Advanced = 2
Human experience	Does the content map onto the physical world of the user?	0 1 2
Expertise	Does the content make appropriate use of mental models and schemas for the user?	0 1 2
Accuracy	Is the content accurate?	0 1 2
Trust	Is the content offered reliable and trustworthy, and does the AI provide context to its reliability?	0 1 2
Total score		

We suggest the HEAT model as a mnemonic evaluative heuristic for TPCs to quickly assess genAI output. While there are other criteria (e.g., is the content biased, is it harmful to specific users), the HEAT heuristic serves as a scoring mechanism to assess genAI output and reminds TPCs that using their

human perspective to check and modify genAI content better addresses users and their contexts.

METHODOLOGY

A goal of this study was to validate the HEAT heuristic as a scoring mechanism for TPCs to evaluate AI-generated content. We used the HEAT heuristic along with open-ended questions (see Table 2) to evaluate the quality of AI-generated content output from a common open-access LLM (ChatGPT 3.5) in response to our prompts.

Overall, we wanted to investigate ChatGPT's performance in two distinct types of DITA content categories, writing conceptual information and step-by-step task instructions. We operationalized these categories as follows:

1. "**Concept topics** present essential conceptual or descriptive information so the reader can understand the background and context of a subject.
2. **Task topics** provide procedural information on how to do something" (Clark, 2017, n.p.; also refer to Evia, 2018).

We explicitly operationalized our scoring based on the context of beginner students and tallied the results of our evaluation. This meant we evaluated content from the perspective of beginner students working to learn how to interact with LLMs such as ChatGPT with one-time prompt strategies and exhibiting more shallow evaluation of content versus our more expert understanding. Our assumption here was first- or second-year college students might see information as more valid—e.g., trustworthy, or credible—if it appeared to answer their question or incorporated terminology from the prompt.

Hence, we used the HEAT model to quickly score whether genAI content was appropriate in the categories of human experience, expertise, accuracy, and trust. After, we answered open-ended questions (refer to Table 2) and reflected on whether we thought generated content (1) worked, (2) was usable, (3) was valid, and (4) we noted our overall impression from the perspective of our beginner students.

Our aim in this study was to get answers to the following research questions:

1. *How can the HEAT model be used to evaluate the quality of genAI output? Is the model workable in terms of assessing the quality of output?*
2. *What level of quality output is created using generative AI (ChatGPT3.5) when creating concept versus task information when using different prompting strategies?*

Table 2. Post-HEAT scoring reflective comment questions

Question	Category
1. What is your overall impression of this information? Please share your overall impression.	*Overall impression of quality of AI output*
2. As an expert in UX and personas, how usable is this information?	*Assessment of usability of AI output for specific technical documentation purposes*
3. How likely do you think beginner users would think this information is valid? (Very valid-Valid-Not valid)? Why do you think this?	*Likelihood that beginner users of AI may see content as valid (may fall prey to cognitive bias that AI output is correct)*
4. Anything else that you would like to share about this scenario?	*Additional information*

We ran a pilot study followed by three more advanced scenarios. The pilot study utilized simple prompts by asking ChatGPT "what is a persona," "what is a persona in user experience design," and "how do I create a persona in UX"—e.g., DITA concept information on personas and task information on how to create a persona. We found ChatGPT performed relatively well on creating conceptual information about personas; whereas it performed somewhat poorly on the task information—how to create a persona. The simple prompts allowed ChatGPT to do what it was asked (e.g., writing good conceptual content on personas); however, step-by-step task output was too broad to implement. Nevertheless, in both cases, ChatGPT performed well on average.

Our overarching goal was to experiment with different prompting strategies to create more advanced AI development scenarios. We used the following advanced scenario prompts to test the ability of ChatGPT to create content with different levels of involvement of AI and TPC:

- **Scenario 1:** *Chain-of-thought prompt* with explicit mention of the difference between DITA concepts and task formats. The AI was primed to understand the difference in formats and write in these formats. This prompt was used to

explore ChatGPT's understanding of DITA and ability to write in either concept or task format.

- **Scenario 2:** *Self-refining AI prompt* (see Louw, 2023) where AI was asked to refine our prompt by asking questions to create an improved prompt that met our expectations (AI-in-the-loop). This prompt examined whether ChatGPT understood what we were asking, could ask questions and refine a prompt based on the TPC's answers, and could produce a more robust concept and task output.
- **Scenario 3:** *Expert chain-of-thought prompt* written by one of the authors as a TPC expert for concept and task. We used this prompt to make explicit our chain of reasoning and provide format expectations for output to see if TPC input would create better quality output.

Our aim for the scenarios was to explicitly incorporate human judgment in the process of both prompting and evaluating generated content. Scenarios 1 and 3 involved a higher level of TPC involvement in writing the prompt, whereas scenario 2 modeled a collaborative scenario where ChatGPT helped refine the prompt for better output by asking a number of questions before execution.

Participants

The participants in this study are the 5 authors. All are considered experts in their field.

Data Generation

We conducted this study December 2023–January 2024 with the understanding that LLMs are continuously learning and developing. We used the free version of ChatGPT 3.5 to mimic everyday student uses of genAI in creating content. One author generated the prompts and outputs and selected the most salient one, then all authors rated the chosen outputs.

Scoring Process

The prompt and outputs were shared with raters with an indication of whether the prompt and content were for a concept or a task topic. The five authors independently read and rated each of the AI-generated outputs using the HEAT heuristic (refer to Table 1) in two rounds: Pilot and Scenarios. Scores were totaled for each output as well as averages calculated for each category in the HEAT heuristic. Each rater answered additional open-ended questions (refer to Table 2) to better gauge the quality of AI output. The open-ended questions were analyzed thematically using qualitative analysis techniques (Creswell & Creswell, 2018). The authors met to discuss ratings and open-ended questions and to ensure fidelity of scoring. This process gave us a baseline to understand the quality overall (total score) and how we evaluated the AI output (through the open-ended questions).

Avoiding Bias and Justification for Methods

During creation of the corpus, answers were generated three times; the most salient example was selected to evaluate best quality output rather than random selection or first output generated. During analysis, the genAI output was evaluated independently before discussion to eliminate bias. We debriefed using reflective commenting to evaluate the quality of ChatGPT output.

Limitations

We note our scenarios represent typical (but not exhaustive) scenarios of content development geared toward co-creation of content by AI. We aim to demonstrate the necessity of incorporating human judgment in generating content with AI. We acknowledge genAI tools are developing in sophistication and may improve in specific writing tasks.

RESULTS AND DISCUSSION

We scored all our pilot and three scenarios with the HEAT heuristic as follows (See Table 3):

Reliability of the HEAT Model

We utilized the intraclass correlation coefficient (ICC) to assess the reliability of scoring using the HEAT heuristic; ICC integrates both the degree of correlation and agreement between measurements when determining reliability (Koo & Li, 2016). A blind review process was used; five experts scored each response independently (12 total; 2 scores of the pilot, 10 scores of the scenarios). The ICC was calculated with SPSS using a two-way mixed model, average measurement, and consistency. For the pilot, reliability was found to be good between eight measurements. The average measure ICC was .743 with a 95% confidence interval from .155 to .970, $F(4,28) = 3.889$, $p = .012$. The raters discussed the application of the HEAT heuristic

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Table 3. Heat scores for pilot and scenarios.

Scenario	Average	Rater				
		1	2	3	4	5
Pilot 1 Concept|Task	**5.6|6.4**	4|6	5|5	7|7	5|7	7|7
Scenario 1 Concept|Task	**4.6|3.6**	7|4	4|2	5|7	5|0	4|5
Scenario 2 Concept 1|2	**6.4|6.4**	5|5	7|7	5|8	8|5	7|7
Scenario 2 Task 1|2	**3.6|4.2**	3|3	4|5	2|3	5|5	4|5
Scenario 3 Concept 1|2	**7.7|6.6**	6|3	7|7	8|8	7|7	7|8
Scenario 3 Task 1|2	**5.8|5.8**	5|5	4|5	7|8	6|5	7|7

and rated an additional ten responses independently to further validate the model. Reliability was found to be good between 48 measurements with the average measure ICC being .825 with a 95% confidence interval from .501 to .979, $F(4, 188) = 5.724$, $p < .001$. Thus, we posit that the HEAT model has good reliability when used as a heuristic for evaluating AI output.

SCENARIO 1: CHAIN-OF-THOUGHT PROMPT

The goal of chain-of-thought prompts is to make explicit one's own reasoning to ChatGPT for better output. For our prompt, we drew upon OpenAI's guidelines to reveal our chain-of-thought with specific format requests. We asked ChatGPT to *roleplay* (act as a technical communicator) and specified *required format* (user documentation and DITA concept or task content) and *delimiter* (4–5 paragraphs). As part of the delimiters, we primed ChatGPT with specific input on the DITA concept and task formats and asked if it understood the different categories for DITA, which it said it understood. For both scenarios, we used this input as a *delimiter* by using triple quotation marks and confirmation of understanding to identify the *beginning* and *end* of specific information units (refer to Figure 1).

> **Scenario 1 Prompt for Concept:** *"Acting as a technical communicator that uses Concept topic format, please describe what a user persona is in the field of UX. Write in 4–5 paragraphs. Provide full description that is ready-made and can be used in user documentation."*

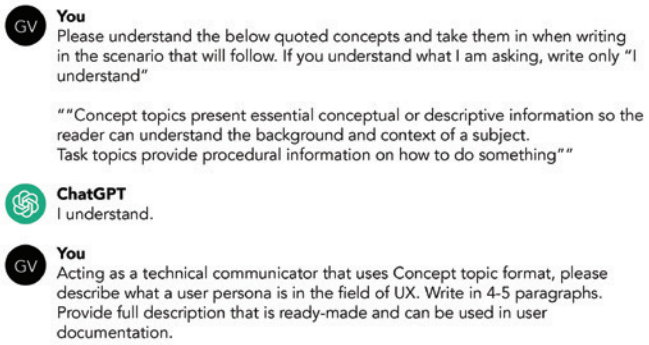

Figure 1: Feeding a priming prompt to ChatGPT to create delimiters

> **Scenario 1 Prompt for Task:** *"Using IBM's Task topic format in DITA and acting as a technical communicator, please describe what a user persona is in the field of UX. Write in 4–5 paragraphs. Provide full description that is ready-made and can be used in user documentation."*

The output of these two prompts were unexpected given the precision of the prompt and the following of OpenAI's guidelines for better output. Of note, we checked before whether ChatGPT knew about DITA, which it confirmed by quoting us back the format. However, in its output, we saw an awkward synthesis that indicated it did not understand the request and hallucinated its response. For TPCs, this is an important finding—ChatGPT has not (yet) mastered DITA concept and task format writing.

Second, ChatGPT was unable to distinguish format requests from assigned topics. ChatGPT's concept output featured multiple introductory sentences like "Adopting IBM's Concept Topic format," or "Within the Concept Topic format" which was an undesired output; we asked it to adopt that format, not write about it. Likewise, it concluded, "In summary, within the conceptual paradigm of UX design, using personas crafted by the Concept Topic format serve as conceptual guide," showing ChatGPT tried forcefully to connect these ideas.

Hence, for the concept, ChatGPT tried to connect the concept topic of personas to DITA, and its output suffered as a result. One researcher noted, "I was not expecting the writing […] to become so atrocious […] How many times can you use the word 'concept' in this

response? Too many!" and a second, "There was a lot of wordiness and filler added (how many times can it say conceptual?) that made it sound less knowledgeable."

For the task, ChatGPT did not use hierarchical ordering of one step/action following another from structured authoring. Instead, ChatGPT returned an agenda-style sentence: "Leveraging IBM's Task Topic format in DITA, we can delve into the structured creation of a user persona, an indispensable tool for human-centered design." However, while it gave "Defining user personas," "components of user personas," "informing design decisions," and "facilitating collaboration" as headers above paragraphs, the content it provided erroneously related personas to DITA generally.

Overall, in both prompt outputs ChatGPT failed to write in the specific manner requested and instead treated our request for a specific technical writing format as a topic. The failure to write in our requested formats is interesting. In future prompts, we could implement more explicit chain-of-thought prompting, e.g., specify we want a numbered list for tasks, and only conceptual information for concepts.

SCENARIO 2: SELF-REFINING AI PROMPT

In the second scenario, we leveraged *a self-refining AI prompt* (Louw, 2024), which features specific instructions for ChatGPT to "function as a specialized AI prompt engineer," interrogating the user following a "structured process for iterations of continual improvement" (n.p.). This scenario instructed ChatGPT to (1) make an initial inquiry on the *subject* and *objective* of the prompt; (2) based on input from the user, create an *enhanced prompt*; (3) *ask clarification questions* of the user to improve the prompt for both AI and specific user needs; and (4) to *repeat this cycle until all its prompt specification questions had been answered* for the revised prompt.

Through self-refining prompts, ChatGPT becomes an *active interlocutor* in *writing a prompt* by asking the technical communicator multiple questions based on its internal modeling and understanding. Whereas chain-of-thought prompting asks TPCs to explicitly model the format and structure before ChatGPT carries out the task, the self-refining prompt reverses that process.

This type of interactive AI prompting is interesting because ChatGPT shares its modeling and understanding. The back-and-forth with ChatGPT made it recommend a versatile prototyping tool with general accessibility and popularity (it recommended Adobe XD, Figma, and Sketch for this) and using Unsplash.com (an open-license image website) for persona development, among other improvements. Hence, we found the self-refining AI prompt challenged us to write a stronger prompt through collaboration.

That said, our experience was mixed. When we tried to create a task topic, ChatGPT completed its questioning in only 6 iterations. On a concept topic, it asked us 21 follow-up questions with no end in sight. To create a workable prompt, we intervened and retried the process, giving shorter answers. Hence, we stopped our final concept prompt after 7 iterations, which we felt was sufficient:

> **Scenario 2 Prompt for Concept:** *"Compose a formal paragraph (less than 250 words) providing a general overview of the concept of persona in user experience design. Construct a concise structure with a topic sentence, a main section explaining the role of personas in understanding user needs and behavior, and a conclusion highlighting their significance in creating user-centric interfaces. Additionally, include a conceptual example focusing on the creation process, utilizing a simple hypothetical username to illustrate the fundamental steps in persona development."*

> **Scenario 2 Prompt for Task:** "*Develop a comprehensive step-by-step guide for crafting a persona in user experience design. Illustrate the process with the selection of stock photos from Unsplash.com, emphasizing the creation of the persona on paper. Provide specific guidance on visually representing the persona and its characteristics in a general approach. Recommend a versatile prototyping tool based on general accessibility and popularity. Offer guidance on identifying specific pains and gains using general questions, helping users understand the distinct perspectives between the persona and the designer."*

For the concept, ChatGPT did well describing personas in one paragraph, adding depth to nuances of personas in a second paragraph that gave an example persona, "Alex," to enhance the readers' understanding. One researcher remarked, "This is informative, useful, and feels fairly well-written." Several noted, however, that ChatGPT's output didn't follow specifications for

one paragraph, instead writing two. We assumed that 250 words was a good length indicator because it was a specific number together with the request for one paragraph. However, we had not considered that LLMs have a known limitation in seeing text through their *tokenizers* for monetizing purposes, where it may have difficulties in distinguishing between human requests (one paragraph please) and the tokenization process. A token is not the same as a word but can be seen "as pieces of words" equating to roughly four characters: "tokens are not cut up exactly where the words start or end—tokens can include trailing spaces and even sub-words," white space, punctuation symbols, and more (OpenAI, 2024). In reverse engineering this output, we found the word count for the paragraph was 219 (less than 250 words); but when we used OpenAI's tokenizer (https://platform.openai.com/tokenizer) to count the tokens, there were 266.

For the task, ChatGPT incorporated many verb-starting sentences that could be used in documentation. It generally followed the prompt in the order given. However, while these lists could be used to begin a step-by-step guide for persona creation, both outputs were too general for actual use. For example, one researcher remarked, "It's more like a 'checklist' than a detailed, step-by-step guide […] it doesn't even mention research methods for data collection such as conducting interviews, site visits, or think-aloud protocols." Another stated, "It's also not a task topic in my opinion just by virtue of being a numbered list of items; I would be unable to operationalize most of this list in any real way after maybe step 3." Broadly, we felt ChatGPT helped us refine our prompt, giving us confidence it could write a strong answer, but the end-result output was again too broad in scope to be actionable.

Overall, using a self-refining prompt had mixed results. In writing a concept prompt, we had to intervene to simplify the prompt, giving us good results. ChatGPT's response to the task prompt provided new and unusual ways of creating personas, but the breadth of the answer came at the cost of depth. Once again, while ChatGPT did well with conceptual information, the task prompt output was not in-depth, but rather a high-level bulleted list of actions that was missing necessary information for beginners. We posit that tokenization has a large role in ChatGPT's output, and our finding of non-compliance with format specifications in a prompt being due to tokenization is an important realization for TPCs.

SCENARIO 3: CHAIN-OF-THOUGHT-PROMPT USING TPC EXPERIENCE

The third scenario used chain-of-thought conversational prompting with the expertise of a TPC. One author wrote both prompts and a concrete context with parameters (one paragraph), including output and goal of the information (e.g., a concept in one paragraph; a task in one paragraph) and the context in which we wanted it to write (e.g., cross-use of personas, specific and clear for beginners).

> **Scenario 3 for Concept:** "*I am writing user documentation. I am trying to write a clear definition of the concept of user personas in UX that will give people the idea in a nutshell. I am not looking for step-by-step information, just a clear overview in one paragraph. The concept of user persona has to involve getting people to understand that they are not fictional, but archetypes of typical users that are shared in a company context with other designers, product managers, and other technical people. It needs to be simple but specific and clear enough so that a beginner can understand the concept and apply it right away."*

> **Scenario 3 for Task:** *"I am writing user documentation. I am trying to write a clear step-by-step process of creating a user persona in UX that will give people the idea in a nutshell. I am not looking for deep conceptual information, just a clear overview in one paragraph with numbered tasks on how to do this as a task. The concept of user persona has to involve getting people to understand that they are not fictional, but archetypes of typical users that are shared in a company context with other designers, product managers, and other technical people. It needs to be simple but specific and clear enough so that a beginner can understand the concept and apply it right away and do it."*

In contrast to the previous scenario, the concept output was written in one paragraph. The output addressed the prompt well, using nuanced language and appropriate definitions. However, one noted that despite telling ChatGPT to address the "not fictional, but archetype" definition of personas, ChatGPT used personas as fictional characters anyway, thus breaking the constraints of the prompt.

For task output, ChatGPT provided action-verb listing headers consisting of "define your purpose," "conduct user research," "identify patterns in users," "create archetypes," and so forth, with a descriptive 1–2 sentence overview of actions to be taken in each major step. One of us noted that the prompt must have guided ChatGPT to actually produce instructions: "Repeating a task over and over and including step-by-step must have bullied ChatGPT into actually producing a list of steps." This comment reflects previous prompts not producing adequate step-by-step information (with one researcher remarking that they weren't convinced that ChatGPT *could* write step-by-step instructions).

Overall, both prompts resulted in better outcomes for both concept and task information. The concept paragraph was one paragraph as specified and contained appropriate information; the task paragraph was written in an understandable way that used action-verb starting headers and actionable sentences describing what was needed to accomplish the header task. However, one researcher noted that "The bullet list writing of ChatGPT is starting to be somewhat anemic and surface level. What is there is good, but doesn't tell you completely how to do it, but this is also due to the delimiter of 'one paragraph.'"

Ultimately, the use of expert-crafted chain-of-thought prompts led to higher scores for HEAT and trust in general. ChatGPT was good at writing conceptual information when given specific length parameters but struggled with task prompts. The chain-of-thought prompting with TPC expertise (human-in-the-loop) seemed to produce the most success with ChatGPT, though we note important limitations in terms of writing with specific length limitations (most likely due to the tokenization process).

IMPLICATIONS AND CONCLUSION

We tested three scenarios representing different strategies for TPC-AI content co-creation. We found that:

- ChatGPT performed well in writing concepts topics, but less so in writing tasks.
- ChatGPT breaks format prompt specifications due to the tokenization process.
- ChatGPT operates well using conversational language at this point, but less so with specific language used by content strategy (DITA, task vs concept topic).
- The HEAT model can be used to make a quick evaluation of how AI-generated content scores on human experience, expertise, accuracy, and trust.
- New models for developing content are emerging, but TPC expertise is still needed.

The implications of these findings are:

- **Full content automation is not realistic:** ChatGPT has many issues related to recognizing human experience, developing content expertise, or being accurate or trustworthy. Since its tokenization process may allow it to break formatting requests, or confuse formatting requests with topics to write about, TPCs still need to check output.
- **AI-generated content still needs to be checked:** Our HEAT model was able to help provide a baseline of the quality of output.
- **Prompt engineering matters:** More research is needed on the impact of different prompting strategies on output quality.
- **AI lacks the ability to write in numerical sequences for task topics:** Unless overtly prompted, ChatGPT lacks the ability to write structured, actionable numerical tasks with appropriate depth.
- **TPC prompt expertise and LLM knowledge yields better results:** We got better results when using conversational language and understanding ChatGPT's underlying assumptions; ChatGPT did worse when asked specifically to use DITA format categories for concept and task topics.

That is, while genAI may be seen by companies to generate automated content more quickly and efficiently, LLMs still require TPCs to write quality prompts and evaluate and modify output. TPCs bring critical expertise skills into the workplace including rich and tacit understanding of different "genres, stakeholders, processes, symbols, and tools;" rhetorical awareness and ability to seek new knowledge while navigating multiple organizational constraints; drawing on multiple semiotic registers (e.g., visual, verbal) to create quality documentation (Schriver, 2012, pp. 304–305). Further, TPCs are subject-matter experts (SMEs) in their work (Mallette & Gehrke, 2018); and while we may be asked to present ourselves differently as "AI content leads," we think TPCs are ideally positioned to make the above contributions. As we note,

incorporating HEAT—human experience, expertise, accuracy, and trust—as a heuristic can help TPCs to both evaluate content and to make a case for their value in AI-generated content to companies. In other words, TPC expertise is still necessary for developing quality prompts, evaluating output, and modifying content to meet diverse user needs. Without expertise to discern between usable and non-usable content, automated genAI-created content has questionable value.

The use of genAI is promising for content development but requires that TPCs assess content critically. Given the difficulties of genAI in addressing various human contexts and inferring dynamic human states, it is important to incorporate a human-in-the-loop perspective that seeks to evaluate and refine AI output. Our HEAT heuristic shows potential for this purpose. It is imperative that genAI feature contextual information as to the quality of content generated. Accuracy scores, user feedback, and notifications to remind users to cross-check information are necessary. The UX of AI, therefore, fosters understanding that genAI output is not the end, but a beginning of writing.

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Understanding the Hidden User for Content Strategy

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By Nupoor Ranade

ABSTRACT

Purpose: This research paper explores the following phenomena that impact content strategy in technical communication (TC): 1) understudied user analysis methods that reveal users' information seeking behavior, 2) changes in infrastructure design for innovative user research practices, 3) skill sets required by technical communicators to carry out content strategy tasks.

Methods: Methodologically, the article reports findings from 19 interviews conducted with TC practitioners who hold titles such as technical writer, content strategist, information developer, information architect, and documentation manager.

Results: The interviews revealed more than 13 practices/methods in which users' interactions resulted in data that provided more information about them which impacted the design of content platforms. I classified the findings into 4 main categories of users' interactions that hold valuable insights about users' information consumption behavior. These insights that can be used to make informed content strategy decisions are lost if the data is not carefully processed.

Conclusion: This paper demonstrates how user interactions can inform research on content strategy in TC and how it impacts the processes of users, as well as the impacts on existing roles of technical communicators. I argue that we need to be more purposeful about analyzing users' interactions that produce data and design infrastructures to support interactions as part of an organization's content strategy goals. My future work will focus on how issues such as privacy, surveillance, and incentivization can be handled in situations where users' information is used for audience analysis purposes.

Keywords: Content Strategy, User Research, User Generated Content, Practitioner Roles

Practitioner Takeaways

- Technical communicators can use methods discussed to develop new methods and infrastructures to learn about their audiences.
- The methods proposed will allow for participatory frameworks and decentralization allowing diverse audiences to participate in content management thus promoting social justice through content strategy decisions.
- The infrastructures will help build collaborations and partnerships across multidisciplinary organizational stakeholders and contribute to effective problem solving through content strategy and development.

Understanding the Hidden User

INTRODUCTION

The technical communication (TC) field has undergone various shifts over the years owing to new approaches to developing information (Albers, 2003; Carter, 2003; Rude, 2009; Swarts, 2011), technology adoption and diffusion (Andersen, 2014; Dayton, 2006), and the nature of work activities such as being networked (Hart-Davidson et al., 2012; Swarts, 2010) and distributed (Hart-Davidson, 2009; Salvo, 2004; Whittemore, 2008). Some changes that were documented along the way include processes such as topic-based authoring, minimalism, single-sourcing, structured authoring, and technologies such as XML, component content management, static site generators, and Git. Another function, a part of technical communicators' job roles, that brought about a shift in the field was access to user data that helped technical communicators learn more about their users' needs and expectations from content (Turns & Wagner, 2004; McGuire & Kampf, 2015). Audience analysis has always been a big part of technical communicators' jobs. However, with increased access to users' input into online documentation platforms through features like comments, like and dislike buttons, social media posts, and discussion forums, technical communicators can evaluate their audiences at a more precise level leading to customization and personalization of documentation (Andersen, 2014; Breuch, 2018). Such audience insights not only help us create customized content, but also help with decisions on content design and therefore content strategy.

Users' inputs or contributions play a key role in content strategy, especially in product documentation spaces. In 2002, Steehouder argued about the importance of learning from users to set up documentation such that it appears more like a communication dialogue rather than an information site. To design documentation in that manner, we need to evaluate users' requests and design the responses as answers to users' specific questions (Steehouder, 2002). In order to do this, technical communicators started analyzing user requests. Most studies that describe such analyses did so by analyzing content created by users (Barton & Heiman, 2012; Cooke, 2021; Swarts, 2015) such as reactions on existing documentation platforms, feedback, and comments (Ranade & Swarts, 2022; Doan, 2021; Gallagher & Holmes, 2019). All these methods work with content that is always visible and available for analysis.

Some newer methods that record users' interactions with documentation platforms are not always visible. For example, the Documentation as Code (DaC), popularly known as the docs-as-code approach, is a revolutionary methodology in which technical writers and other organizational stakeholders, including users, can contribute and maintain the product documentation platform using the same processes and tools as software code development (Gentle, 2017). Since contributions happen on the back end, or the tools interface, end users cannot view other users' contributions until they themselves decide to make a change. This hides some user inputs and along with the needs of those users. Another example is users' activities recorded in the form of web analytics data. Based on browser settings, different data gets recorded from every users' browser. This data is invisible to end users and sometimes to the technical communicators too (depending on each organization's policies). The data hides characteristics of users that challenge the process of tailoring responses to users' specific needs. I believe that we need to be more intentional about exploring such users' interactions through conscious interventions and strategic methodologies.

In this article, I term such users, whose characteristics get hidden, as "hidden users." Although data gets generated due to their interactions, most times it remains invisible, thus challenging the process of user analysis. For example, a user's information seeking behavior on Google Search is recorded through interactions like entering search terms (keyword choices) and the decisions they make about which result to choose from a list (navigation behavior) to solve their problem speedily. Both data points are unique—the keyword choices depend on the user's background and the navigation behavior depends on the specificity of the problem they are facing. Because these interactions are not visible (unless someone is more intentional in analyzing the behavior of a particular user among hundreds or millions), the interactions remain unknown. I have termed such interactions that generate data as invisible interactions.

While technical communication scholars have studied audience contributions to platforms such as user forums (Swarts, 2007; Frith, 2017), feedback on public websites such as blogs (Gallagher, 2020), and interactions with social media posts (Breuch, 2018), there is very little research on invisible interactions.

Such interactions can provide several insights about audiences, especially in online content deployment spaces. *Hidden users* and *hidden users as part of hidden communities* are studied in other disciplines like communication networks and information systems (such as Blekanov et al., 2021; Burrell, 2012; He et al., 2015; Yoshida, 2013). Models such as He et al.'s (2015) that use web analytics to assess audiences and thereby inform an organization's content strategy plans have been widely used for quite some time. He et al.'s competitive analytics framework provides a process for identifying highly engaging topics in social media content. The framework not only interprets the verbal content, but also helps note invisible interactions to identify users' sentiments that are then used to identify patterns and craft strategic recommendations for new content development (He et al., 2015; Kordzadeh & Young, 2022). To expand such models, media scholarship has, in fact, encouraged participation from users as a way to decentralize and empower users (Bruns, 2008; Spears & Lee, 1994; Westlund & Lewis, 2014) for more than two decades. This paper borrows literature and methods from the fields of technical communication and media studies to analyze new sites of study that allow exploring hidden users, invisible interactions, and their impact on content strategy.

While user contributions provide insights into users' needs, problems they face, and their unique characteristics, not having formal methods to analyze the contributions can lead to several issues. For example, researchers show that it is essential to analyze digital data privacy to build trust through sound user research practices that use data analytics to improve content development and marketing activities (Leonard, 2014; Martin & Murphy, 2017). Ethical research practices lead to proper and transparent privacy policies that in turn provide perceptions about fairness and distributive justice (Petrescu & Krishen, 2018). Privacy is only one issue. Other problems arising due to the lack of strategic methods of audience analysis by analyzing user contributions are un-incentivized contributions or free labor, unauthorized surveillance, and lack of transparency.

This article documents research that helped develop formal methods of analyzing users' contributions to gain insights about users or audiences that can be used for content related decision-making. Just knowing the methods is not enough; we need to formalize best strategies to incorporate the methods into technical communication research and practice. To do that, I describe my research as a response to the following two main research questions:

1. In what ways do users' interactions reveal their content consumption behavior to inform content strategy?
2. How do new methods for user analysis impact the role of technical communicators and the design of information platforms?

The paper starts by providing a background on user research methods and their impact on content strategy. The methods section describes the process of identifying user interaction processes that produce data that can then be used for analysis. The next section elaborates on the findings of interviews conducted with technical communication practitioners to identify methods of user participation that are not visible. The last section elaborates findings that lead to decision-making for content strategy by drawing connections between a user interactions case study and the role of technical communicators, especially information architects, in the process.

BACKGROUND

Two concepts that are most akin to users' interactions with content that directly impact content strategy are 1) users' engagement with content (to access the information they need), and 2) users' contribution to content development (by producing content). Both of these can be classified as active forms of interaction. When users merely consume content to solve their problems it is known as passive consumption; when they are allowed to make or propose changes to the content, it can be termed as active interaction. An example of passive consumption is when a user reads the documentation topic "Sign up for a Microsoft Copilot Studio trial" on their web browser. However, when they interact with it in a way that produces content, it is called active interaction. Recently, infrastructures have been created in a way that allows users to contribute a great deal to content platforms.

An example of active interaction that leads to content development is as follows: if a user clicks on the edit button (refer to Figure 1) on the documentation portal, they are redirected to the backend which is set up using GitHub. The user can login to the GitHub platform, make edits to the content as required, and

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submit the change to be considered for publication by the Microsoft documentation team (refer to Figure 2). This can be seen as active interaction. This paper explores methods of active interactions, and how they affect content design. This section will shed light on the further classifications of active interactions, demonstrating how they take place (through example cases) and how they can be used for analyzing users' information seeking behavior.

Figure 1. Click Edit to Make Changes

Before diving into the types of active user interactions, we need to define and understand user engagement which is the most common type of active interaction. Engagement is a multifaceted concept manifested in the form of different psychological states including enjoyment, endorsement, and anger, along with behavioral responses such as liking a post or leaving a comment thus generating more content or data that records users' specific interaction (Kordzadeh & Young, 2022). Action-oriented data can be used as metrics for determining the quality of content; for example, number of likes, comments, and shares are commonly used by practitioners and researchers to measure engagement. In sales and marketing content, popularity of the company, product, or service is based on the number of visitors (hits). Therefore, a high level of engagement is a desirable organizational goal. However, for product documentation, more views could mean that the user experience of the product is not effective which is why the users are having to visit the documentation site more often. Thus, engagement data could be used to question the intuitiveness of the product's functionality. This phenomenon calls for re-evaluations of the product design itself and its perceived quality (Ranade, 2019).

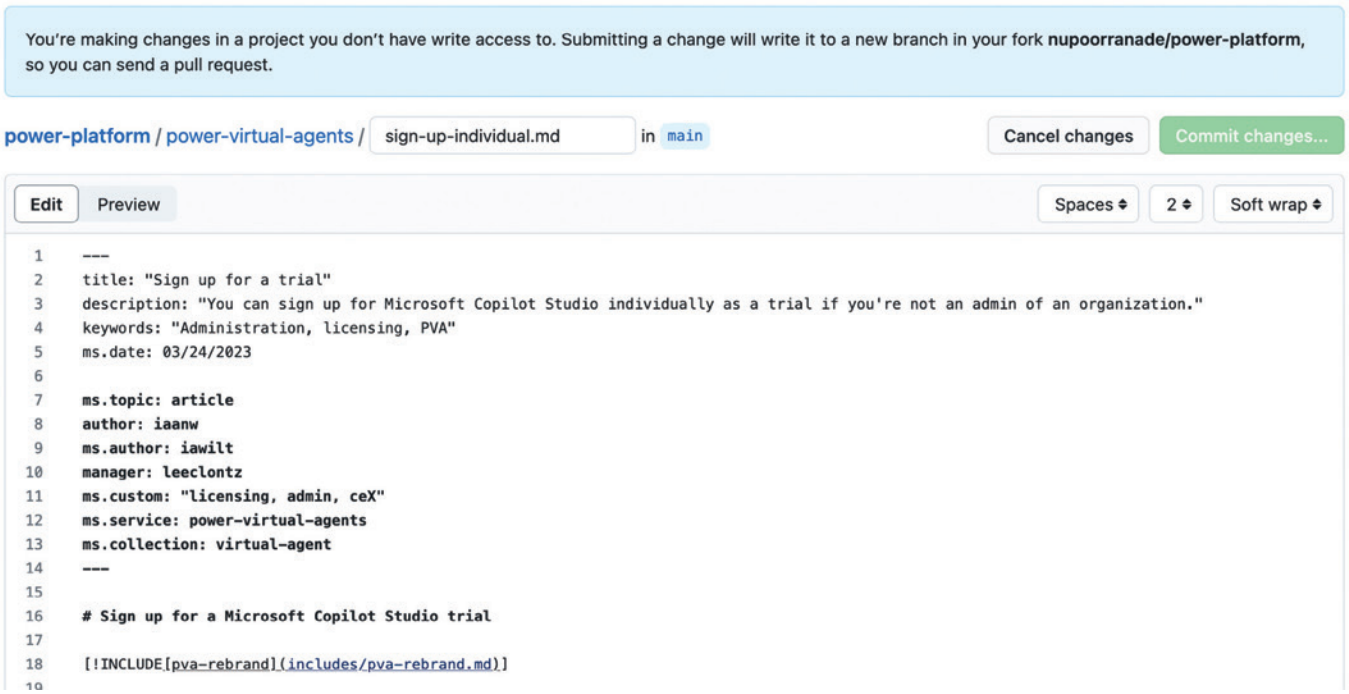

Figure 2. Make Changes and Commit to Propose Them to the Microsoft Team for Incorporation

Another form of active interaction common across web documentation spaces is *produsage*. I borrow this term from media studies where scholars have used it to describe the technological and technosocial frameworks of user-led content creation (Bruns, 2008). The term was used to highlight the disappearance of the distinction between the roles of "producer" and "consumer" in collaborative spaces. While media scholars discussed Web 2.0 environments such as blogs, Wikipedia, and YouTube, I am specifically interested in the phenomenon as it applies to collaborative documentation platforms like GitHub which allows users to participate in the content production process. Beyond allowing consumers to become producers of content, produsage affords a decentralized system which is different from the typical hierarchical roles. It eliminates the need for "top-down" interventions and conventionally controlled production processes. In this manner, a decentralized process, where users can participate in developing a shared knowledge base allows for every user to document their unique positionality through their contributions, which become part of the documentation platform. When analyzed, these contributions help in expanding user personas beyond those identified by technical communicators through traditional methods such as usability testing.

To discuss users' active interactions with content, I would also like to discuss the concepts of "implicit and explicit audience participation" also borrowed from media studies. As mentioned earlier, some user interactions do not leave any visible traces of users' contributions. These can be termed as implicit participation processes. Mirko Tobias Schäfer described the concept of implicit participation as the subtle, conscious engagement of users in online communities which provide more information about their agency (2011). On the other hand, explicit participation is less subtle; it involves active engagement where user data can be revealed instantly. Schäfer (2011) argued that implicit participation is achieved by implementing user activities into user interfaces and back-end design, and the success of popular Web 2.0 and social media applications thrives on such implicit participation. These concepts have contributed to the development of numerous theories of participatory culture. For example, Henry Jenkins and Axel Bruns both focused most prominently on explicit participation (Schäfer, 2011) and formulated theories to understand cultures by analyzing the contributions of community members.

As mentioned earlier, in the technical communication field scholars have explored the ways in which technical communicators can participate in distributed knowledge activities by recording user interactions and making sense of user contributions in knowledge development processes (Breuch, 2018; Frith, 2017; Gallagher, 2020; Swarts, 2007). This work began after the foundational concept *audience involved* was proposed by Johnson (1997). However, most of the research, like media studies, looks at explicit user contributions. To analyze these explicit contributions, technical communication scholars have studied the ways in which collaborative technical communication spaces operate, where collaborators interact using any means of participation like forum posts, feedback comments, or edits to wiki-based documentation systems. They have also studied the impact of such work on the role of technical communicators, who function as an intermediary between domain experts and users (Ranade, 2021). By understanding desired content gaps between users' needs and already published content, through these contributions, technical communicators adopt the roles of usability specialists, user advocates, and content designers (Redish, 2010). Redish also cites Mirel's work to point out that TC researchers have found that well-structured documents may not be useful to users if they are not accessed as expected. Technical communicators can modify content organization and content design so that the content is findable; by editing content, technical communicators are able to address discrepancies across terminology used (that impacts searchability), context creation, and clarity of how the information is interpreted.

This process of conducting user research to design information aligns well with the goals of content strategy. Batova and Andersen (2016) synthesized various definitions of content strategy that are relevant to technical communication work in order to identify their common focus on organizational vision for information and an action plan for achieving it. It is a continuous process which brings together various content development communities (Batova & Andersen, 2016) including users, thus breaking disciplinary silos and biases.

User or audience analysis remains the most important step in content strategy. Analyzing users'

interaction is crucial, but is also under-researched and under-discussed in technical communication scholarship. While citing Weiss' work, Albers (2004) explains that with most of the challenges of usability and communication already solved (or handled by other teams), technical communicators' roles need to evolve. A possible direction for evolution is to become content strategists who, along with creating content, also handle user requests by architecting content management systems and documentation databases (Albers, 2004; Andersen, 2014). The back end of product documentation which involves the tools and technologies make it harder for audiences to participate in content production processes. Swarts (2018) argues that such design issues complicate social adaptation and need to be replaced by Mirel's *constructivist* documentation approach (1998) in order to include the social, cultural, and technological dynamics of users' work. Technical communicators' roles must be elevated for them to content strategists and information architects to be able to mediate between technologies and users. To gauge user problems, they must be allowed to closely monitor users' contributions. Sharing the genre, context, and technology will motivate users to participate in organizational processes, enabling technical communicators to interact with them more directly. This decentralized approach thereby improves information design. This will help in achieving organizational goals of ensuring that information is made available and accessible to users who are seeking to solve their problems.

Considering implicit user participation allows for a more accurate analysis of users' needs and problems, as well as the role of information design and information technology (technology used to publish information) that shapes user interactions and content itself (Schäfer, 2011, pp. 51–52). The methods of providing user inputs or feedback raises new questions about the agency of feedback contributors and their role in the technical communication process. Content producers rarely share their positionality with everyone else in the content development network. For example, although anyone can contribute to sites like Wikipedia, or social media sites like Twitter, only that content which gets moderated is made available for public viewing. To understand the roles and positions of stakeholders and users, we need to look at content development processes more closely. Additionally, users' feedback is more than often related to the problems they are trying to solve and their needs. How can we use feedback from users and their interactions to identify their needs? One way to do that is to treat content moderation as a process that coincides with audience analysis. Once that is done, the audience's information navigation behavior can be studied to make decisions about content strategy.

So, for this research, it was important to use methods that would look at the back-end design of audience interactions and analyze processes that led to data (or content) creation in some form. To do so, the research was conducted in two stages: first, a mixed-methods approach was used to conduct interviews with practitioners in the technical communication field and to find spaces of user interactions (both implicit and explicit). Then, some of these spaces were studied closely to understand users' content consumption behavior and the gaps in information design systems. This revealed the roles of users, content designers, technical communication stakeholders, and technology involved in the process of decentralized content development by revealing hidden users on these information platforms.

METHODS

This study was developed to identify hidden users by analyzing users' implicit participation in content development and its impact on content strategy for any information platform. Since previous research has mainly focused on explicit contributions (such as feedback comments, social media posts, etc.), collected data has been more straightforward. To explore implicit participation made by users, this research had to uncover the spaces where such contributions were made by speaking with relevant stakeholders and then analyzing the whole network of relationships that facilitated such user contributions. To do so, I started by first surveying technical communicators in the software documentation industry and then conducting interviews to get more details about processes that collected data from user interactions, and how it was used for user research. In this section, I describe the methodology for my research. I first provide details on the data collection and then the approaches to data analysis, addressing the questions of study credibility and trustworthiness at each stage.

I chose to focus my data collection and research in the computer and software industry for many

reasons outlined as follows. Apart from my experience and industry partnerships built over several years in these fields, this choice was dictated by the significant amount of technical communication and user research in the technology industry that this research could contribute to. Audience interactions, especially in online environments, are more prevalent in the software industry. The IT revolution in the late 1980s gave rise to the need to publish product documentation online. Businesses became more globally distributed and teams no longer worked in the same location. The software industry quickly adopted new technology and approaches to allow collaboration among remote teams. Therefore, practices that led to the evolution of content strategy such as structured authoring (Baehr, 2013; Evia et al., 2015; Verhulsdonck et al., 2021), DITA (Evia, 2018; Lam, 2021; O'Neil, 2015; Snow, 2020), content management systems for collaboration and version control (Getto et al., 2019; Getto et al., 2022; Nordheim & Päivärinta, 2006), and agile methodologies for managing product documentation teams, etc., became more prevalent in software industries. Since it was possible to develop, implement, and maintain technological solutions required to complement these approaches completely in-house, software companies became quick adopters as well as leaders in legitimizing these approaches. Additionally, studies such as those by Techwhirl (Document 360) show that over half of the employed technical communicators in the US work in technology-related fields. The U.S. Bureau of Labor Statistics' employment projections show that a majority of writers from 2019–2029 will be hired by the professional, scientific, and technical services industry. These reasons not only make studying cases from the software industry more important but ensure that results of this research will be applicable to the current and future scene of content strategy practices in the field (Ranade, 2021).

Data Collection

For research studies such as this one, that involve a large, diverse set of users located globally who have access to the same content platforms but may access content in different ways and in multiple languages and play different roles in organizations, it is important to collect data in more than one way. I relied on a combination of data-collection methods that helped me gain a broader perspective of content publishing situations and ensured methodological triangulation at the data-collection stage to avoid researcher bias. The combination of multiple methods of data collection ensured sound methodological design. To gather and study the relevant data, I set up a two-step methodological approach which consisted of observations and interviews.

In the first step, I conducted observations on various product documentation websites to identify spaces of user interactions that led to content generation in software documentation spaces. I studied sites of three different organizations with whom I was employed for three years in total. I also observed websites of other popular documentation websites including Microsoft (docs.microsoft.com), Red Hat (access.redhat.com), IBM (ibm.com/docs), VMWare (docs.vmware.com), and Google (support.google.com/docs/). While working as a technical writer for major companies, I found that many medium scale companies follow the model of popular large scale companies for their information design decisions. I was tasked with conducting a competitor analysis to do the same for one of the three organizations. Therefore, including the popular platforms was crucial.

In the second step, I interviewed practitioners who provided the most current and relevant information about information platforms and the ways in which the implicit contributions were facilitated. Detailed conversations with these practitioners helped me trace the entire process—starting from user interactions that generate content, followed by how technical communicators use that content to analyze users' needs, and finally how the results of analyses inform decisions about content design. This section will describe these steps in more detail. This study was approved by NC State University's Institutional Review Board (Protocol Number: #20423, Approved in 2019).

Participant Recruitment Process

For the interviews, I recruited participants from software companies using a targeted selection followed by a chain referral system. First, a list of technical communicators' names and contact information was created based on my experience of working with them in their respective organizations (during past internships or collaborative projects), or peer-referrals from other employees (except supervisors) who have known their work. I also scanned public profiles (LinkedIn, Twitter,

and professional websites) of potential participants who had desirable characteristics based on the stated experience on those platforms. I also publicized the study through a podcast to gain interest from technical communicators in the field. About 60% of the interview participants were recruited using this system. The remaining 40% were recruited through a chain referral system, that is, initial subjects were asked during the interview to identify peers that would be able to make relevant contributions and also be interested in participating in this study. During recruitment, information about the research goals and research process was shared with potential participants over email. If they agreed to the interview request, they were asked to sign a consent form and share their availability for an interview.

With the targeted recruitment, I was able to recruit participants, but the dataset was limited. Because I only reached out to technical communicators in my network, they were from similar geographic regions and had similar demographic characteristics. This would have led to researcher bias. To prevent that, scanning more profiles on LinkedIn helped diversify the dataset (Sullivan & Spilka, 2010; Yin, 2009). The participant dataset included technical communicators with varying experiences (from 1 year to 18 years), who belonged to multiple nationalities, who resided in 3 countries, and who spoke different languages. Most worked with documentation sets written in English, but one person worked with both Chinese and English. Including multiple methods for collecting data helped me achieve methodological triangulation and adjusting the methods based on input from participants allowed me to compensate for the weaknesses of each method.

Interviewing Process

Based on participant availability, interviews were scheduled for one hour each and questions were shared in advance. All interviews took place over Zoom. Interviews were recorded and transcribed before being analyzed for identifying case studies. The interview process for this study was semi-structured (DiCicco-Bloom & Crabtree, 2006; Glaser & Strauss, 2017; Knox & Burkard 2009), that is, the questions lay somewhere between completely structured (or standardized) and completely unstructured. The goal of structured interview questions is to expose all participants to exactly the same interview experience (Fontana & Frey, 2005), so that any differences are assumed to be due to variations among participants rather than to differences in the interview process itself (Fontana & Frey, 2005). Unstructured interviews mostly consist of open-ended questions. Sometimes they start with a single topic-introducing question and the remainder of the interview proceeds as a follow-up and expansion on the interviewee's answer to the first questions (Kvale, 1996).

A list of 10 structured questions (listed below) was made to ask technical communication practitioners about the practices in which audiences interact implicitly with documentation that results in revealing users' characteristics that are otherwise hidden from conventional user research practices.

- Do you develop content collaboratively for internal/external documentation?
- Can you describe your role as <professional title/position> at <organization name>?
- Do you have access to users of the project/s you work on either through usability tests, content development processes, analytical software, or any other means?
- How do you solicit contributions from internal and/or external entities?
- Do interactions with users generate content? Is that content used? How do you handle that content? Do users know that they can participate in content development?
- If yes, for content development processes, can you describe the process in detail. How can users participate? How is the content moderated? How many stakeholders are involved?
- What does the publishing process look like from the time they contribute to inclusion or exclusion in released docs?
- What other tools are involved in the process? Are the users/contributors familiar with them?
- How long have you been working with projects that use participation from the community of users? Do you think it has changed the role of business and/or professional communicators?
- How do you manage collaborative projects? (Methodology—agile/kanban/scrum/scaled agile/waterfall).

After learning about their practices, open-ended questions were asked to follow-up and document as many details about the process of content generation

and its inclusion into official technical documentation as possible.

ANALYSIS AND FINDINGS

I conducted 19 interviews in total. The participant pool consisted of employees who worked for 9 different software companies, who identified as technical communicators, and who played roles such as writers, technical communication managers, content strategists, data analysts, information developers, and information designers for technical communication teams (refer to Figure 3).

On an average, interviews lasted for approximately 40 minutes (total interview time: 566 minutes). All participants were asked the same set of questions. In cases where data was uniquely relevant to the research, or if responses were not completely clear in terms of providing details of the organizational processes, follow-up questions were asked (35 in total). As mentioned earlier, the chain referral system was used to recruit more participants after the preliminary interviews. After 19 interviews, similar data patterns were observed, so I decided to terminate the interview process. At that point, all interview recordings were saved in a secure location and transcribed to identify viable case studies. A closer analysis of the transcribed interview data revealed several broad categories across which audiences interacted with the documentation platforms (as depicted in Figure 4). They are quantitative feedback (such as a thumbs-up for helpful content, star ratings for a topic, etc.), users' contributions to the organization's formal social media platform (such as comments on Facebook, Twitter, or user forums), raw content (such as GitHub contributions), digital footprints (such as data analytics where users' information navigation behavior like search keywords or navigation pathways that lead to helpful topics, etc. are recorded), and other (those that could not be part of these categories including calls with technical support teams and chatbots).

In all, there were 13 practices (refer to Figure 5) in which audiences interacted with documentation platforms and each of those practices could be used to learn about audiences. Among those listed here, qualitative feedback and social media can be counted as explicit interactions. For this research, I only wanted to consider implicit interactions. Therefore, I will discuss those cases from the interviews.

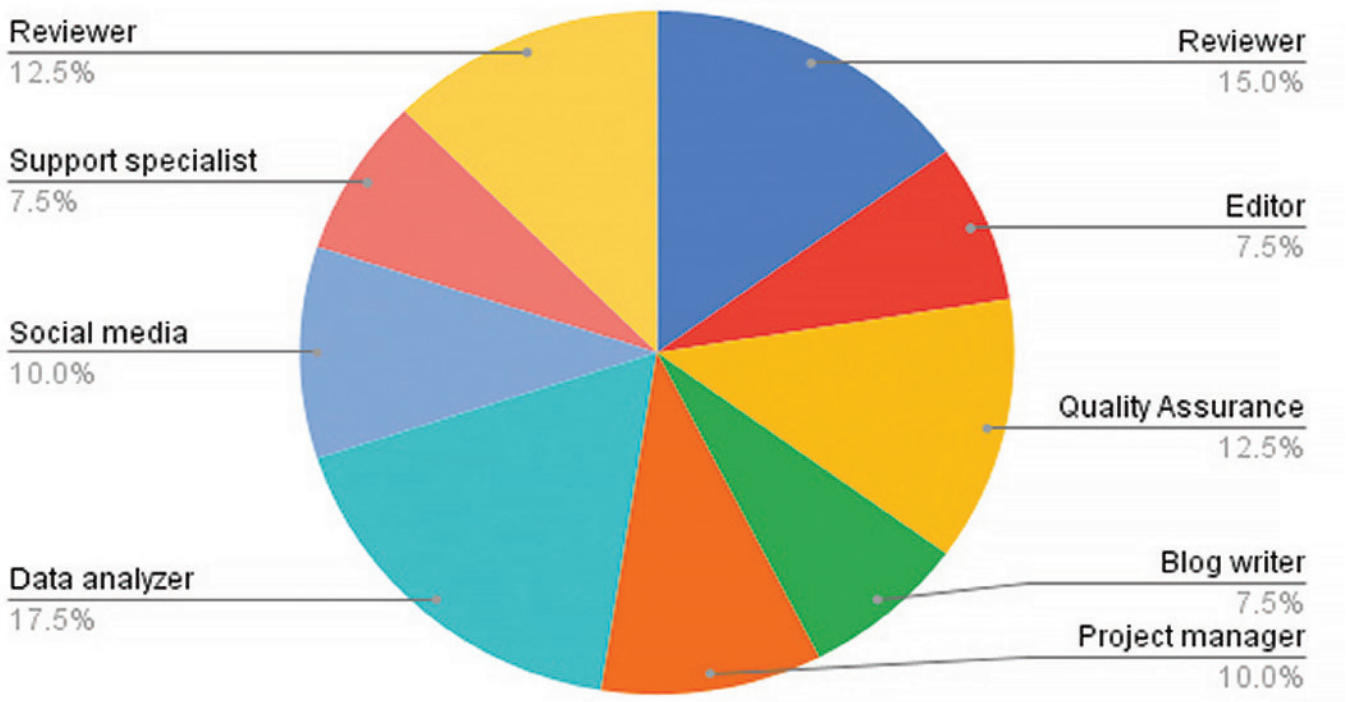

Figure 3. Participant Roles

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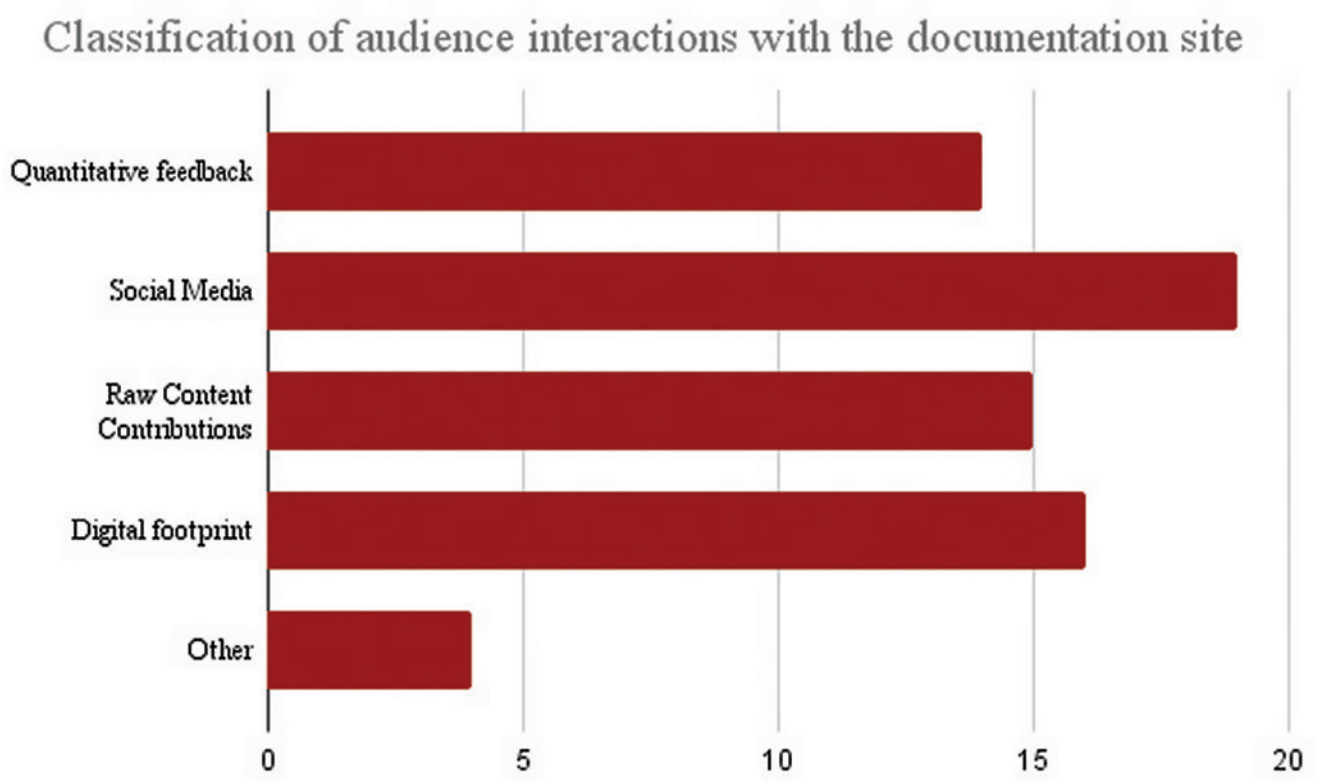

Figure 4. Classification of Audience Interactions

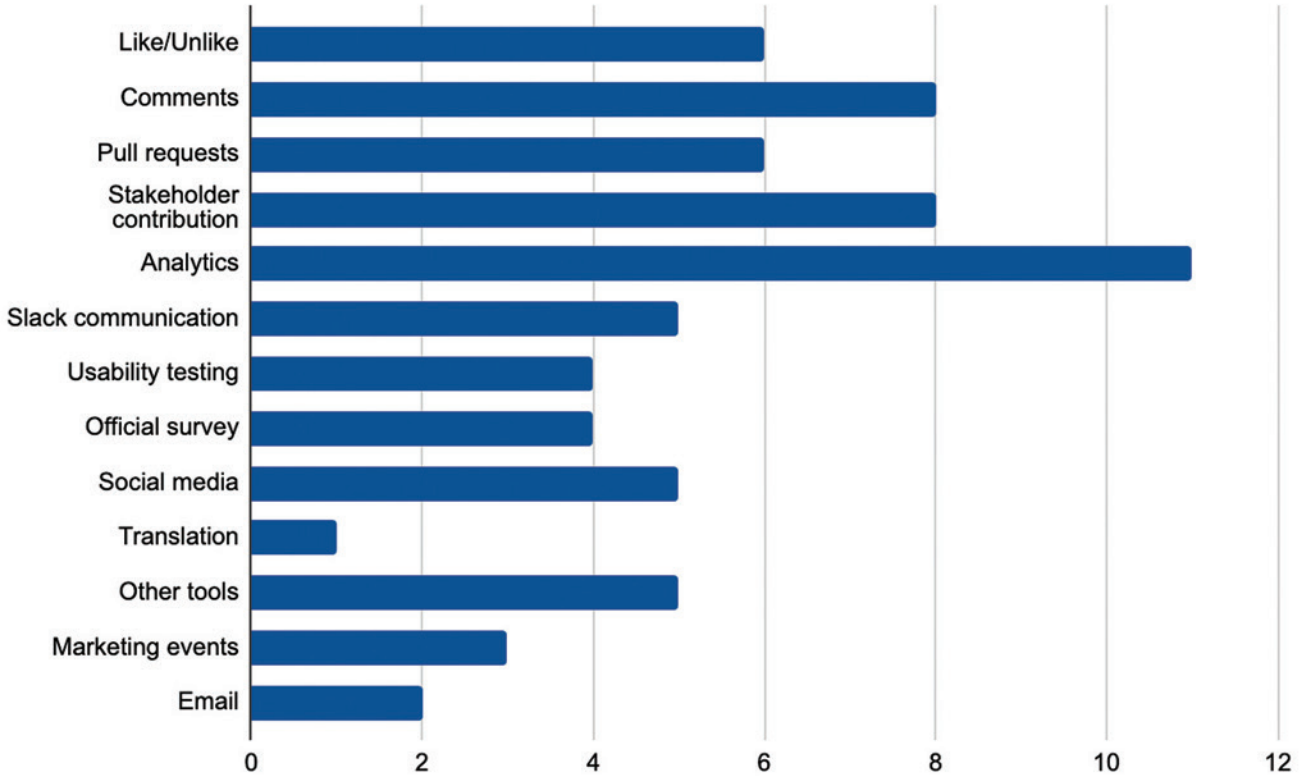

Figure 5. Practices that Record Users' Implicit Interactions

Implicit Interactions of Audiences

In this research, I sought to understand the more implicit user interactions that produce content and their impact on content strategy and in turn on technical communicators' roles. To identify such invisible audience interactions, I interviewed technical communication practitioners who either designed or utilized content management systems that recorded users' interactions. The interview questions that gave these practitioners an opportunity to discuss implicit user interactions were:

- Do interactions with users generate content? Is that content used? How do you handle that content? Do users know that they can participate in content development?
- What does the publishing process look like from the time they contribute to inclusion or exclusion in released docs?
- What other tools are involved in the process? Are the users/contributors familiar with them?

The 13 cases mentioned earlier (Figure 5) are methods that practitioners shared to describe their organizational processes of recording user interactions with documentation content. Out of those, 4 approaches can be classified as implicit interactions. They are:

- Pull requests
- Stakeholder contributions (support team)
- Analytics
- Slack communication

Based on the definition provided earlier, implicit interactions are those through which users do not leave any publicly visible traces of their contributions. For example, feedback comments can be viewed publicly, so they are not included in these findings. But pull requests on GitHub can only be viewed by the technical communication team and other internal stakeholders, so they can be included in the data. In this section, I'll provide more details about these interactions, and discuss how they are facilitated, what information they contribute, what technologies are used for their functioning, and how they affect the organizational content strategy.

Pull requests on GitHub

A pull request (PR) is created by users when they wish to make a change or propose a change to the existing documentation by making the change themselves on the GitHub platform. GitHub is an online platform that provides hosting services using the tool Git (a version control system) which allows efficient management of any information developed collaboratively (for example source code, documentation, etc.) by users. It allows users to create a personalized local copy of information, make changes to it, and, with the permission of the owner of a central repository hosted on GitHub, integrate local changes with the central repository (Ranade & Swarts, 2022). Every permitted, updated version of information is saved in the central repository and locally revised versions are saved in local repositories. These features of the platform allow external collaborators like customers and end-users to contribute to the platform without making visible changes. Fifteen out of 19 participants reported using Git for their documentation management.

Out of the 15, 12 participants used GitHub and 3 used BitBucket. Most participants explained that end-users have to fork the public repository, or create a copy, and make changes to it to convey to the technical communicators that that change needs to be made. From there, the technical communication team mirrors the change on the public facing repository to incorporate that change into the public facing documentation set. When the interviews were conducted (in the summer of 2020), there was no direct process to accept changes by users directly in any of the organizations. Participants also said that most changes were typos. For missing information, such as a specific problem that they were facing, they did not write up content, but "raised it as an Issue" using GitHub.

GitHub Issues allow users to create text-based descriptions of tasks, bugs, changes, and updates in the project and then keep track of them systematically. JIRA is another tool that can be used similarly. However, one participant remarked that most users prefer to use GitHub "because of its simplicity and ease of access compared to JIRA." Because PRs are generally invisible to the public (unlike documentation), unless users visit the back-end system (like GitHub), user contributions are generally low. Participants from two organizations mentioned that user contributions on GitHub were low until they released a blog post on "How to get involved in the product documentation development process." After posting about it, users became more active in their contributions and "now communicate directly with one another on GitHub through Issues."

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Analytics

Web analytics is the measurement, collection, analysis, and reporting of web data to understand and optimize web usage. Web analytics tools like Google Analytics (GA) record users' interactions on online documentation systems in an invisible manner. In most cases, users don't have access to the data recorded from their interactions. As users access and navigate through the content on documentation websites, web analytics scripts running in the background record users' activity and collect data points such as which topics the user visited, how much time they spent on a web page, how many users visited a page in an hour, what browser the users used to access the content, which country the user accessed the website from and in which language, and so on. Four participants mentioned that their technical communication team had access to such metrics to help them "spot trends, identify content that audiences spend time viewing, and can make content related decisions based on that." For example, one participant mentioned that analytics provided them with access to information about "the regions where their users belonged" which helped the technical communication team make decisions about localization. Such data helps ask questions like: Is the content available in the language spoken by most users in the region? Are there any terms that are not translatable and can change interpretation? Have usability tests been conducted to assess the audience in that region? Such questions not only help assess users' characteristics, but also help tailor the content strategy to specific users' needs.

Slack communication

Slack is a cloud-based team communication platform developed by Slack Technologies (now owned by Salesforce), that originated as an internal communication tool. It is designed to help teams communicate more efficiently and effectively. Slack allows for communities, groups, or teams to join a "workspace" via a specific URL or invitation sent by a team admin or owner. Slack provides transparency by allowing users to see all the conversations and messages in one place. This makes it easy for team members to catch up on what has been discussed and follow the conversation without having to search through multiple channels or threads. Slack also offers flexibility by allowing users to customize their notifications, so they only receive the information that is relevant to them. This allows members to only follow topics of their interest. Slack offers chat-style features, including persistent chat rooms known as channels, which are organized by topic, as well as private groups and direct messaging functionalities. A workspace can contain both public and private channels, with public channels being accessible to all members of the workspace.

The interviews revealed that at least seven practitioners used Slack to interact with their customers. One way they mentioned was using Slack to "set up channels for various products" where both internal stakeholders (like developers, testers, and technical communicators) and external stakeholders (like customers and end-users) participated in communication activities. The channels were used to broadcast news and important information related to products such as upcoming features and changes to documentation platforms. However, they noticed that these channels were used by customers to "ask questions about documentation, find gaps in documentation, and suggest changes." Slack channels are used as a dedicated space for communication activities between customers and any other internal stakeholders. It helps them contribute to improving the product and documentation quality by avoiding formalities and "skipping formal task delegation."

Practitioners from one organization mentioned that their official customer forum was linked to Slack in a way that questions and concerns raised by customers were directly pipelined into Slack conversations. From here they could then be directed to stakeholders responsible for solving the problem. Practitioners mentioned that Slack afforded informal communication, saved time, and improved efficiency. Customers' questions help technical communicators find issues that are specific to certain customers and the ways in which they use the product. If those are not handled in the documentation, they can take notes and incorporate changes in the next version of the documentation cycle.

Stakeholder contributions

The last category of user implicit interactions is stakeholder contributions. Although only a few participants mentioned these, my study revealed that it was a significant method that recorded user interactions and users' problems but remained invisible due to disconnect between inter-organizational teams. Two

participants mentioned their involvement with the technical support staff that was part of the organization. One of the participants used to be on the support team, and therefore chose to be more involved. The other participant worked with the support team on a different project that led them to discuss documentation problems as well. Support staff routinely interfaced with customers solving their problems on chat tools or over email or phone. They saved records about the calls as documentation which served them if a similar call came in, or if another support staff came across a similar case. However, it was observed that this documentation was not shared directly with technical communicators who were not aware of specific user problems since they did not get to interact directly with these customers.

Two other tools that different stakeholders used across the organization, Pendo and Salesforce, had similar outcomes. As users use the product, Pendo tracks the features used most frequently. Similarly, Salesforce data is recorded and managed by different teams in organizations and consists of content created through users' actions, such as requesting help from support teams, leaving feedback, and assessing their ability to resolve problems after a support call has been completed. Tools like Pendo and Salesforce contribute significant user knowledge to the organization which gets lost due to the disconnect between different teams. Without communication infrastructures, the use of this data for the purpose of user analysis remains limited and restricted to certain teams. Participants mentioned the need for streamlined processes that would benefit their team and the organization as a whole.

Hidden User

The case studies mentioned in the previous section help clarify the concept of the hidden user. On Git platforms such as GitHub, users can leave comments that, besides themselves, are only visible to administrators who are part of the organization that own the documentation platform. These platforms are used to accept or delete suggestions made by those users, and generally not used for user research due to limited visibility.

Similarly, data analytics access is most commonly provided to marketing and sales teams to improve audience engagement in order to get potential (and existing) customers interested in products and features offered by the organization. Very few participants had access to any data analytics tool. Without the right tool, analytics data—although recorded with every user interaction—remains invisible which restricts technical communicators from being able to study users' information navigation behavior more closely.

Communication with end users handled through support teams or other stakeholders remains hidden from technical communicators. This happens for many reasons but, primarily organizational silos where business divisions operate independently and thus, individuals are not able to share information across teams.

Content Strategy Implementation

Identifying hidden users has significant benefits—first, organizations are able to study users by using various methods that can help validate results. Second, implicit interactions result in data that's always already present. It saves costs that are otherwise spent on explicit methods like usability testing. Finally, it provides alternate methods for user research. This study does not suggest substituting these methods for other user research methods, but instead suggests they be used to supplement other forms of research in order to make results more reliable. Such analysis of users and their information seeking (or content navigation) behavior reveals the following implications for content strategy:

- Technical communicators must identify hidden users and find ways to access information about them by breaking silos and building relationships with different stakeholders.
- Technical communicators must develop ethical ways for recording users' interactions that will help uncover hidden users when other user research methods fail.

Accordingly, I believe that changes can be made to update the content strategy of organizations based on the users' information received from each of the categories of implicit interactions. I explain this with specific examples of case studies for each category mentioned previously.

Pull requests can be used to find missing content based on users' requirements. For example, in my past work (Ranade, 2021) I've discussed the case study from Microsoft's documentation website. The user *thethales* created a pull request to add a small snippet of content—a new procedure to open Performance Monitor (https://github.com/MicrosoftDocs/windowsdriver-docs/pull/2562commits/6be04e06cb2335ae0912025ba52caec0c4eb8241). The PR was

assigned to the designated official DOMARS by Ted Hudek, who is another user associated with Microsoft, and handled by DOMARS until it was merged with the original content that appears on the public facing documentation site (https://docs.microsoft.com/en-us/windows hardware/drivers/debugger/determiningwhether-a-leak-exists). Not only was content changed, but the ability of the user to address the need for using the comments feature in the PR creation process provided more information about the user's specific needs and also a justification for making changes to content. Having such communication infrastructures are important for revising content strategies.

According to the latest work of Hocutt et al. (2024), data analytics can be used to modify the information design and content updates to respond to user needs that may go overlooked by traditional usability testing and audience analysis techniques. For example, user profiles analyzed through web analytics can help technical communicators to identify pathways through which users access information. They can decide whether the existing information architecture supports users' methods of accessing information. Alignment between existing information architecture and user pathways through the content confirms content design (Hocutt et al., 2024), whereas divergence suggests making changes to the content design by considering additional data points like pages visited, time on page, and session length (Hocutt et al., 2024).

Both stakeholder contributions and the presence of Slack reinforce the need to have direct communication channels with users and to engage in iterative analysis of communication data. For example, support teams can share users' problems that are related to finding information topics on the documentation website. They can also suggest topics that users frequently need help with. Technical communicators can then classify those topics as "FAQs" or "Relevant Topics" so that they can be found easily. Informal communication through platforms like Slack allow for participation of multiple stakeholders who can help resolve users' problems but who are separated by organizational or physical boundaries.

DISCUSSION

The method proposed here—understanding users through implicit contributions to inform the content strategy of software documentation platforms—is not a substitute for other methods of user research such as usability testing, qualitative analysis of user inputs, and interviews with stakeholders. It is meant to augment existing methods of content strategy through an in-depth analysis of user participation that otherwise remains unutilized. Following are other considerations of employing this method.

Infrastructure Setup

The role of infrastructure used to connect different components of the process—users, stakeholders, content platforms, technologies—is important and needs to be implemented carefully. The technology needs to be configured such that it supports user interactions and the associations between various components in the communication situation. For example, Slack is an infrastructure that is set up for synchronous communication, and to build a network of users who can help resolve each other's problems through a shared medium. In such cases, user participation is encouraged and made visible for everyone to participate. Data analytics software can require financial investment. Organizations have to evaluate their return-on-investment (ROI) on such a technology. I argue that web analytics is still affordable compared to usability testing. Usability testing is challenging in terms of finding a good representative sample of participants who have to be incentivized to participate in a study. However, analytics is a service that allows access of data from hundreds or thousands of users spread across the world. While there are ethical considerations to using this data, patterns that are outliers can be used to determine information seeking behavior of minority sets of users, which cannot be done through usability testing methods.

Rules and Regulations

Opening communication channels across all stakeholders requires technical communicators' intervention through moderation as well as setting up rules and guidelines to prevent contributions that are illegal, inappropriate, harmful, and biased. Some participants mentioned the need for "codified expectations" or an official set of rules and guidelines for user contributions. They include style, structure, and formatting requirements. Rules also reveal the contributor's authority, gender, tone, and voice. When users are adding content that provides more

information about their individual identity, case, needs, and problem, their culture and language is revealed openly. Guidelines must include language that encourages healthy contributions as a decentralized way for the community to solve problems. Opportunities to increase credibility through point systems must be allowed, but not necessarily forced. Point systems are a way to incentivize and encourage users to contribute. But unless it translates into value for the contributor, the incentivization may not be justified.

Formal rules can be published on public viewing platforms like documentation sites. Examples of these are Microsoft's Contributor Guide (https://learn.microsoft.com/en-us/contribute/) and public Style Guide (https://learn.microsoft.com/en-us/style-guide/welcome/).

Roles of Technical Communicators

In order to analyze users' implicit interactions, technical communicators need to employ different skills to develop and maintain infrastructures that will record data related to users' problems and personas. This process must also happen iteratively. The challenging part is to detach from organizational processes outside of those related to content development that technical communicators are conventionally held responsible for. Most practitioners agreed that they play roles beyond content development. Such roles need to be identified, encouraged, and supported in organizations. Some examples of such roles are:

- **Content moderators**: As more users are contributing to content platforms, technical communicators will have to become content moderators. For example, in the case mentioned earlier, user *thethales* added a few new lines of content. The designated technical communicator DOMARS not only helped merge the content into the public facing documentation, but before doing that, reviewed it and made sure the information was accurate and suitable for use by other audiences in addition to the user posting it.
- **Reviewers:** The previous example described a writer's role in moderating content after reviewing it. Although we can say that the reviewing tasks are not new and writers have always conducted peer reviews within technical communication teams before publishing, reviewing content generated by other stakeholders extends that role even further.
- **Content strategists:** Technical communicators' tasks have grown beyond writing to developing information designs that will not only make documentation platforms usable, but also enable users to interact with content more freely. Although only a few participants had these experiences, most participants agreed that their teams are increasingly expected to get involved in usability testing and content strategy operations. By using data to understand users, most writers can make recommendations to improve what gets published.
- **Product testers:** In the interviews, technical communication practitioners commented that in cases where users such as *thethales* have reported errors in the content on documentation sites, writers first try to reproduce the errors and then solve it by creating appropriate content. Traditionally, this task was only performed by software testers or the quality assurance team. Due to the direct communication channels between users and writers, writers are able to participate in such processes in order to ensure the accuracy of content.

CONCLUSION

This study demonstrates that implicit users' interactions hold significant value for technical communication teams. They help them go beyond traditional usability testing methods to analyze users' needs and characteristics. They help technical communicators use the findings of that analysis to develop or modify the content strategy of documentation systems. This research can be used to further discussions about the specific methods of deriving data and analyzing it. Some advantages of this method are that it can be used to conduct inclusive design work in order to include diverse audience voices while also building collaborations across the organization. While users can leave feedback, they can also engage in conversations about content updated. This direct communication process allows them to develop relevant solutions for problems that are specific to users' contexts. Apart from inclusivity, the methodology uses an interdisciplinary approach

allowing diverse entities across the organization to participate in audience analysis unlike usability testing or other methods that focus only on a few (in most cases just one) teams. Since all audiences participate (either knowingly on platforms like GitHub, or unknowingly through data analytics), there is a higher likelihood of finding audience needs that are representative of a bigger audience sample.

One limitation of this study is the interview sample. However, after the first 19 interviews, I hit a saturation point in terms of the variety of data that I could derive. Saturation is defined by many as the point at which the data collection process no longer offers any new or relevant data (Dworkin, 2012). There is a variability in expert opinions on what is a minimum number of interviews required for a study like this one. A large body of literature suggests that anywhere from 5 to 50 participants is adequate. Most scholars argue that the concept of saturation is the most important factor to think about when mulling over sample size decisions in qualitative research (Charmaz, 2006; Dworkin, 2012). In this study, I noticed a saturation when the discussions (interviews) with practitioners revealed similar tools and practices used by them to collect user inputs in the documentation development and publication process. The snowball method allowed me to analyze the data soon after collecting it, helping me detect saturation early on in the process. Another limitation is that the results of this study are not generalizable. The study was conducted on software product documentation which is a small part of the technical communication industry. So, the findings are most applicable to technical communicators working in those spaces.

It is true that the method proposed here creates some challenges and concerns for technical communicators. Product documentation platforms are primarily designed for disseminating information to audiences, not for soliciting input. Therefore, technical communicators will have to focus on information design to develop infrastructures that welcome users' feedback. This raises concerns about incentivization, free labor, and transparency about users' work for organizations. While these concerns were beyond the scope of this research, it's important to discuss them before new systems are implemented. Such issues must be analyzed more carefully and audiences must have a choice of participation.

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Jackie Damrau, Editor

Books Reviewed in This Issue

The reviews provided here are those that are self-selected by the reviewers from a provided list of available titles over a specific date range. Want to become a book reviewer? Contact Dr. Jackie Damrau at jdamrau3@gmail.com for more information.

Work Well From Home: Staying effective in the age of remote and hybrid working

Bloomsbury Business. 2023. Bloomsbury Publishing. [ISBN 978-1-3994-0389-4. 96 pages, including index. US$14.00 (softcover).]

Work Well From Home: Staying effective in the age of remote and hybrid working is a self-help primer for workers transitioning to a remote work role. This book is aimed at workers considering full-time remote work, but some tips can be useful for those who occasionally work from home.

Working from home has benefits including a reduced commute, but the authors warn it is not for everyone. People who are extremely extroverted or who have trouble separating their work and home life should think carefully before making a switch to a remote work environment. If you choose remote work, you should create a dedicated environment with good lighting, comfortable furniture, and a door that closes you off from the rest of your home.

When making the transition to remote work, anticipate an adjustment period. You should set clear boundaries about your starting and ending times and establish a routine to begin your workday. This could be as simple as making a cup of coffee, closing your office door, and turning on your computer. The authors also warn not to yield to the temptation to work in your pajamas. Getting dressed in real clothes creates another psychological boundary between work and home life.

To prioritize your work time effectively, use tools like to-do lists and a calendar to keep track of milestones and deadlines. To maximize your focused time, you should also manage your inputs by limiting checking your email and phone to dedicated times throughout the day.

Communicate regularly with your key contacts: colleagues, bosses, customers, and so on. Reach out to establish and maintain a rapport by connecting with your co-workers on a personal level. Initiate a video call at the beginning of a relationship so you can see body language and hear tone to establish a good foundation for the relationship. Use collaboration tools to work together asynchronously between virtual meetings.

To combat isolation and maintain good relationships, make regular contact with your colleagues and friends. If you only communicate when you need something, contacts will dread taking your calls. Consider in-person meetings occasionally when feasible (meeting for lunch or coffee) and continue to attend valuable in-person events such as training and office parties as often as possible.

The final chapter covers striking out on your own as a freelancer or starting your own business. It seems out of place with the rest of the book and could have been omitted with no loss of value to the subject at hand.

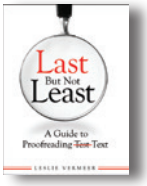
Overall, *Work Well from Home* is a practical handbook for starting an effective remote work routine. I would recommend it to anyone who has recently transitioned to a remote role or is considering it.

Bonnie Winstel

Bonnie Winstel is a Project Analyst at Science Applications International Corporation (SAIC). She received her master's degree in English and Technical Communication at the University of Alabama-Huntsville in 2013.

Last But Not Least: A Guide to Proofreading Text

Leslie Vermeer. 2023. Brush Education Inc [ISBN 978-1-55059-787-5. 162 pages, including index. US$24.95(softcover).]



Leslie Vermeer, a writer, editor, and professor, with more than twenty years' experience in book publishing, has a clear goal in writing *Last But Not Least: A Guide to Proofreading Text*: "The techniques and procedures in this book will teach you how to proofread your way to excellent documents" (p. xi). She has accomplished her goal by creating a comprehensive, user friendly, and practical guide to proofreading. Vermeer is Canadian and therefore uses Canadian spelling in the text and exercises. However, except for a few exercises focusing on spelling, this is a minor point and does not interfere with others' use of this book.

New proofreaders, students, and experienced technical communicators who don't proofread as part of their usual responsibilities will find this book to be a valuable resource. While experienced proofreaders might not need the instruction, they would find her explanations of proofreading tasks and their importance helpful when discussing their job with people not familiar with the proofreader's role. The book is well organized and formatted, facilitating its use as an ongoing resource, and applies to paper and screen work.

Vermeer begins with defining proofreading and what it is not (including copyediting versus proofreading). This clarification is important as proofreading's scope is sometimes misunderstood.

She explains, "Chapter 1 forms the foundation of the book. It provides specific instruction about how, when, and why we proofread, from where proofreading fits in the production sequence of documents to how to make proofreading marks" (p. xii). Chapters 2 to 6 are organized around a specific topic, such as "Spelling" (Chapter 2), "Punctuation and Mechanics" (Chapter 3), and "Proofreading Visual Communication" (Chapter 6). Chapter 7 concludes the topic with additional tips and advice for successful proofreading while Chapter 8 contains additional exercises. Additional resource material includes appendices, a glossary, and bibliography.

Each chapter begins with a brief exercise introducing the topic ("Warming up to Proofreading"), includes several exercises providing readers an opportunity to practice the skills discussed in a chapter, and ends with a "Building a Thorough Process" section that lists tips and techniques to help readers develop and strengthen their proofreading skills. Because the book's readers will likely represent a broad spectrum of fields and jobs, the exercises are general and are not specific to technical communication. However, the skills practiced in the exercises apply to proofreading technical communication documentation which is not an issue.

Ann Marie Queeney

Ann Marie Queeney is an STC senior member with more than 20 years' technical communication experience primarily in medical devices. Her STC experience includes Special Interest Group leadership, 2020-2022 Board member, CAC Chair, and Education committee member. Ann Marie is the owner of A.M. Queeney, LLC.

Keywords in Design Thinking: A Lexical Primer for Technical Communicators & Designers

Jason C.K. Tham, ed. The WAC Clearing House and University of Colorado Press. [ISBN 978-1-64642-394-1. 166 pages. US$22.95 (softcover).]

Keywords in Design Thinking: A Lexical Primer for Technical Communicators & Designers is a comprehensive collection of short essays by scholars and practitioners that explores design thinking from a technical and professional communication perspective. In short, design thinking is "an approach for creating solutions to difficult problems…as well as a process for seeking resolutions to those problems" (p. 3). The first six essays focus on the design thinking process while the remaining 23 focus on various aspects of design thinking phases, concepts, and applications.

This interdisciplinary assemblage of essays spans a wide array of topics, from "wicked problems," to creativity and inclusivity, with each essay being short and to the point. Tham arranged the essays in alphabetical order, which, unfortunately, makes it difficult to see the relationship between topics. For example, the essays on usability that include ideation, contextual inquiry, participatory design, and usability testing would be best grouped together under one collective heading, while the essays about equity, entrepreneurship, and social justice deserve another.

Each essay contains information on design applications. For example, the piece on rapid prototyping describes the development of a new phone case. The author describes different ways by which the case can be designed using paper or modeling clay to first determine the dimensions. He then recommends drafting a digital 3D file using CAD software. "This process," the author notes, "allows the designer to isolate and test otherwise interdependent elements of a design and quickly deploy the product to its test or target market" (p. 38). This is good, sound advice about how to employ rapid prototyping.

Additionally, each essay contains a "Pedagogical Integration" section where the authors link the design idea to practical classroom applications. In the chapter on Participatory Design, for instance, the author recommends using inquiry, ethnography, card sorting, and focus groups to facilitate the understanding of how one can educate students in a participatory design approach to usability.

Keywords in Design Thinking is a highly academic book supported with extensive research. However, it could have been written with a more applied audience in mind for easier reading. The exhaustive level of academic jargon and copious references present a quagmire in which the reader can easily become disoriented. The book is still a useful primer for academics interested in a wide array of topics as they relate to technical communication and usability.

Lynne Cooke

Lynne Cooke is a Clinical Assistant Professor at Arizona State University where she teaches courses on usability, digital media, and portfolio development. She is also a member of the Arizona Chapter of STC and the Internship Coordinator at ASU.

You Deserve a Tech Union

Ethan Marcotte. 2023. A Book Apart. [ISBN 978-1-952616-61-7. 167 pages, including index. US$36.00 (softcover).]

You Deserve a Tech Union couldn't come at a better time. After years of decline, the labor movement is experiencing a resurgence, and tech companies and departments are beginning to respond.

As the book's Foreword points out, labor exploitation is rampant in the tech industry and work life is precarious. Contract and "gig" work is exploited to exhaust workers and to deny them benefits and protections. "Perks" are used in place of equitable pay to encourage working long hours. Workers are subjected to mass layoffs that enrich management, while disempowering workers and depressing wages. Problems of discrimination, racism, sexism, and ageism are common. And the list goes on.

In *You Deserve a Tech Union*, Ethan Marcotte argues that the many ills that plague the tech workplace are due to wildly uneven disparities in power between employers and workers, and makes the case for resolving them through collective action and forming a labor union.

Throughout, Marcotte writes in a conversational tone, keeps it down to earth, and emphasizes the practical over the theoretical. Knowing that the idea of acting collectively may be new to many young tech workers, he covers just enough labor history to bring the reader up to speed. To make it personal, he asks readers to list the things they hate and love about their work. He then asks them to consider how little power they have to change what they hate, and how little they can trust that the things they love won't go away at the whim of a manager, an erratic owner, or pressure from investors.

Based on interviews with tech union organizers, activists, economists, and others, Marcotte explains what unions are and why they matter—without a union, you don't have a seat at the table—and covers the strategies and steps involved in forming a union. He walks the reader through each of the steps involved, from holding your first exploratory meetings, to forming an organizing committee, to managing the election process, to forming your bargaining committee and contract negotiations. He explains your rights during union formation, the rules governing union elections, and—once the union is certified—the contract negotiation process.

Marcotte also discusses the tactics and pushback that you can expect from management—hiring a union-busting firm, holding captive audience meetings, retaliation against organizers, and other efforts to create fear, uncertainty, and doubt. While the violence of early labor history has lessened, he notes, responses can still be economically and psychologically violent and workers need to be prepared. But with outreach, organizing, and building trust the challenges can be met.

You Deserve a Tech Union includes a list of additional resources covering labor history and the law, organizing guides and training, staying informed on labor issues, workplace surveillance and union busting, the problems of marginalized tech workers, and more.

Whether you are already involved in a union drive, or just want a better understanding of the options available in taking better control of your work environment, you owe it to yourself to read this book.

Patrick Lufkin

Patrick Lufkin is an STC Fellow with experience in computer documentation, newsletter production, and public relations. He reads widely in science, history, and current affairs, as well as on writing and editing. Patrick chairs the Gordon Scholarship for technical communication and co-chairs the Northern California technical communication competition.

Translation Technology in Accessible Health Communication

Meng Ji, Pierrette Bouillon, and Mark Seligman. Cambridge University Press. [ISBN 978-1-1088-3737-8. 300 pages, including index. US$84.99 (hardback).]

Translation Technology in Accessible Health Communication addresses one of the most pressing topics in health care facing the world today: How can we communicate effectively in the healthcare setting with patients who do not speak our language or

who have communication difficulties? Meng Ji, Pierrette Bouillon, and Mark Seligman attempt to uncover the most current and effective ways to communicate with speakers of other languages as well as with patients with communication differences stemming from disabilities.

The perspective offered in *Translation Technology* is unique in that the authors are not unreservedly pro-technology, despite the many recent breakthroughs in machine translation (MT) and the dizzying possibilities for their use. Throughout the book, Ji et al. advise proceeding conservatively and with "informed caution," especially given the potentially deadly consequences of translation errors for patients (p. 4). As an academic who has studied MT, I found this approach prudent as well as refreshing, and it enhanced my perception of the book's credibility.

Aside from explaining how the different methods of MT work and the benefits and drawbacks of each, the book provides a roadmap for creating effective healthcare applications and websites when using MT technologies. Specifically, the authors advise making the applications transparent to make translation errors detectible, making the applications adaptable or customizable for the user or language group, making the applications inclusive for people with disabilities, and adhering to current accessibility standards (pp. 4–9).

The text is organized into a series of chapters that can be read as stand-alone passages or taken to get a broader picture of the current state of MT and its applications in the medical setting. For example, Chapter 6: Healthcare Accessibility for the Deaf – The BabelDr Case Study" would be an excellent selection for a disability studies class in technical or medical communication. Although some cross-referencing did occur between chapters when discussing terms introduced previously, the authors provide enough background for each term to make flipping back through the book unnecessary. The use of examples and visuals depicting these technologies and their interfaces was illuminating and well-illustrated. I could clearly understand what these applications did and how they functioned even without having them at hand to examine.

Translation Technology in Accessible Health Communication is sufficiently clear and well-explained enough to be useful for academics or technical writers in the health fields. Readers from a variety of backgrounds could appreciate Ji et al.'s well-reasoned analysis of the different types of MT available for use in medical settings. Similarly, graduate students in technical communication could benefit from learning about the emerging methods of MT and how these technologies are being used in medical settings.

Nicole St. Germaine

Nicole St. Germaine is a Professor of English and the Coordinator of the Technical and Business Writing Program at the Natalie Z. Ryan Department of English at Angelo State University.

Mid-Century Type: Typography, Graphics, Designers

David Jury. 2023. Merrell Publishers. [ISBN 978-1-8589-4707-5. 240 pages, including index. US$55.00 (hardcover).]

Mid-Century Type: Typography, Graphics, Designers presents a deep dive into post-World War II design; arguably, this is when graphic design history begins in earnest, or at least the modern professional practice of graphic design. The contents include Type Design, Typographic Journals, Posters, Corporate Identity, Advertising, Magazines, Books, Transport, Film & Television, and Ephemera, focusing on a timeline from 1945 through the 1960s. However, some earlier content is presented to establish context for later work. *Mid-Century Type* is a beautiful book that is easy to read and offers an exclusive examination of a very specific period of history.

The book feels substantial and is beautifully designed. The contents are nicely laid out, full of attractive, high-quality images, and printed on luxurious paper. The clever use of the grid structure for the front cover, title page, and table of contents is worth noting; they are reminiscent of the grid used by Adrian Frutiger to identify the weights and variants of his mid-century typeface design Univers from 1957, featured on page 21. The abundance of images helps make the book a quick read, but it is also written in a way that is accessible with minimal technical language that would prevent readers from moving quickly through the content.

This deep dive into post-World War II design certainly presents more names than usual in this era of design history. However, the content is solidly within the canon in that it presents a white male Eurocentric view of graphic design history. The book only mentions a few influential women in this history: Beatrice Warde, Cipe Pineles, Elaine Lustig (Cohen), and Margaret

Calvert. However, it does include several names of male designers that are not typically included in design histories. While the content on women is limited, it is thoughtful in how it presents their contributions and offers some context as to why we don't see more women in this history; "women were denied entry to the printing industry by its unions" (p. 9). Still, it would have been good to acknowledge the contributions of more women, such as Elaine Bass who worked alongside her famous husband, Saul, included in the book. Additionally, the contributions of Georg Olden, a Black American designer for CBS Television, were omitted from the section on Film & Television. Indeed, it seems like no designers of color are present in the book. However, it should be acknowledged that they would have had limited access and barriers to entry in the professional field, like women.

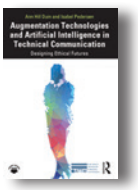
Despite this criticism, *Mid-Century Type* is a wonderful addition to any collection on design history. The images presented make the book worth buying alone, but the approachable way the content is written is geared towards students and practitioners. It also includes good explanations about how technology shifted design practices and reminds us that history doesn't have to be overly complicated in its presentation.

Amanda Horton

Amanda Horton holds an MFA in Design and teaches graduate and undergraduate courses at the University of Central Oklahoma (UCO) in design history, theory, and criticism. She is also the director of the Design History Minor at UCO.

Augmentation Technologies and Artificial Intelligence in Technical Communication: Designing Ethical Futures

Ann Hill Duin and Isabel Pedersen. 2023. Routledge. [ISBN 978-1-003-28800-8. 282 pages, including index. US$48.95 (e-book).]



Augmentation Technologies and Artificial Intelligence in Technical Communication: Designing Ethical Futures delves into the intersection of augmentative technology and artificial intelligence (AI) by exploring their impact on the human experience and the ethical implications of enhancing identity and capability. This book provides valuable resources for researchers and professionals in technical communication, user experience (UX) design, and related fields, addressing brain-computer interfaces, robotics, wearables, and AI-powered emotional augmentation. Ann Hill Duin and Isabel Pedersen provide a comprehensive framework for understanding these technologies as well as resources for research and teaching.

Of relevance to technical communicators, the authors offer a detailed examination of the evolving role of technical communicators considering emerging technologies. They highlight the integration of augmentative technologies into UX design, providing practical guidance on how to incorporate these technologies into user documentation, API references, and adaptive help systems. Duin and Pederson then draw on interdisciplinary research to ensure accuracy and use the Fabric of Digital Life archive for an evidence-based approach. They advocate for a multidisciplinary approach to analyzing augmentation technologies, emphasizing the need for ethical frameworks and digital literacy to guide responsible design and adoption. Their perspective offers a socially conscious and well-substantiated analysis, broadening the understanding of this field beyond previous works.

One of the book's key strengths is its focus on the practical application of augmentative technologies. Duin and Pedersen provide a comprehensive overview of the technologies as well as specific examples of how they can be used in real-world settings. This makes the book an invaluable resource for technical communicators and UX designers who are looking to incorporate these technologies into their work. Another strength is the multidisciplinary approach where the authors draw on a variety of disciplines, including technical communication, UX design, ethics, and sociology, to provide a well-rounded view of the topic. This approach makes the book an essential resource for anyone who wants to understand the social and ethical implications of augmentative technologies.

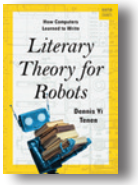
Overall, *Augmentation Technologies and Artificial Intelligence in Technical Communication* is a valuable resource for anyone interested in the ethical implications of augmentative technologies. It offers a comprehensive understanding of the field and a framework for evaluating such technologies. The book is well-written and easy to follow, making it accessible to a wide range of readers.

Danang Handoko Belut Saputro

Danang Handoko Belut Saputro is an awardee of the Lembaga Pengelola Dana Pendidikan (LPDP) PK-176 scholarship for a master's degree in information technology at the Universitas Gadjah Mada in Indonesia. He is grateful to LPDP for providing complete financial support for his master's degree and this book review.

Literary Theory for Robots: How Computers Learned to Write

Dennis Yi Tenen. W. W. Norton & Company. [ISBN 978-0-393-88218-6. 158 pages, including index. US$22.00 (hardcover).]



With all the talk these days about artificial intelligence (AI) and machine learning, most people know that AI learns as it goes. A simple example is predictive text on your mobile phone or tablet. Based on the context of your message and the first letters you type, machine learning curates words and phrases that you often type and ranks them to guess when they might be used again. You can almost imagine AI consulting a word cloud, choosing the biggest and boldest word it sees, and offering it up as suggested text.

Dennis Yi Tenen describes how AI learns as it goes on a much bigger scale in *Literary Theory for Robots: How Computers Learned to Write*. He uses chapters one through five to explore the feeding and training of a collective machine conscience. Surely, it's no surprise that he mentions the creations of Charles Babbage, Ada Lovelace, and Alan Turing in the history of computers.

Yi Tenen references the Markov chain—a sequence of possible events where the probability of each depends on the state attained in the previous event. In the context of *Literary Theory for Robots*, it's a string of words "arranged in a series of statistically probable continuations based on observed probabilities" (p. 101). Because language models are disconnected from experience, they must glean the meaning of words based on how they occur with other words. The more they see the word, the more they "learn" common linguistic contexts.

After exploring structures, patterns, and hidden grammars with the likes of Noam Chomsky, Victor Yngve, Georges Polti, and Vladimir Yakovlevich Propp, the story of how computers learned to write comes into focus. Generative grammars were translating technological complexity for human communication. Yngve's grammar consisted of three rules—addition, randomization, and insertion—that sufficed to construct simple sentences in English (the book doesn't delve into the 108 sub-routines). Still, while the sentences may be grammatically correct, they aren't always sensible.

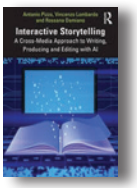
So, yes, AI is making headway in learning and generating the written word, but it seems likely that "AI will neither destroy humanity nor solve all its problems" (p. 121). It's a relatively comforting conclusion for those who make a living based on literary theory, grammar, or writing.

Michelle Gardner

Michelle Gardner is a copywriter and content editor in the life sciences industry. She has a bachelor's degree in Journalism: Public Relations from California State University, Long Beach, and a master's degree in Computer Resources and Information Management from Webster University.

Interactive Storytelling: A Cross-Media Approach to Writing, Producing and Editing with AI

Antonio Pizzo, Vincenzo Lombardo, and Rossana Damiano. 2023. Routledge. [ISBN 978-1-0323-7164-1. 194 pages, including index. $44.95 (softcover).]



This co-authored guide to interactive storytelling is robust, detailed, and filled with multiple practical examples, references, and analyses for creating interactive stories. Except for the first and last chapters, the volume is not for beginners new to creating interactive media. These two chapters are readily excerpted for technology, writing, media, gaming, and instructional design courses.

The Introduction offers an important overview, defining interactivity, telling stories through different types of action as well as five important issues related to interactive stories. Thus, this provides an important working foundation and key frames for the rest of the text.

Chapter 3 covers dynamic elements and storytelling's different units. The chapter also discusses dynamic elements and the agents as well as how these impact planning, conveying emotions, and the state of the game's world. Chapter 4 addresses display: audience, system, and emotions. Two golden nuggets in this chapter: it addresses narratology versus ludology and interaction versus narration. These discussions could

be excerpted for lower level or introductory courses on interactive fiction, storytelling, and gaming because of their brief but clear differentiation and identification of key concepts and issues.

Much of chapters 3–5 delve deeply into specific interactive storytelling engines, working with and optimizing databases, planning for plot generation, coding characters' emotions, as well as supporting automation and simulation. This is not for beginners; however, it provides important guidance and best practices for more advanced interactive fiction readers, writers, and researchers.

Chapter 6 reviews 18 different games and interactive stories from the past half century. These descriptions and analyses start with *Eliza* (1966) and ends with *Down the Rabbit Hole* (2020). They also engage with well-known media like *Myst* (1993), *The Walking Dead* (2012), and *Black Mirror: Bandersnatch* (2018). Each review features roughly one page of description and one page of analysis. For each game, the authors focus on the story world, dynamic elements, engine, and display. These emphases do two things: (1) offer solid models for potential student reviews or analyses while providing a consistent structure for framing and critiquing individual interactive stories and games, and (2) build directly upon key concepts established earlier in *Interactive Storytelling: A Cross-Media Approach to Writing, Producing and Editing with AI*. These models could also be useful for educators working with educational games, game design, game analysis, storytelling, interactive fiction, and related topics. While the 18 reviews are persuasive and significant, most students would likely suffice with four to five of these reviews.

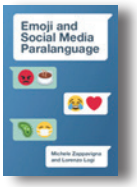
Interactive Storytelling is written for advanced or experienced experts or researchers familiar with interactive fiction technologies, methods, and platforms. Several chapters could easily be excerpted for less experienced learners and classes. New readers to interactive storytelling, gaming, or game design will want to read the Introduction, skip to Chapter 6 to read five to seven of the reviews, and then read the rest of the book to learn. Given the book's accessible price, it could also scaffold skills and understanding for scholars and writers interested in interactive games and fiction.

Gregory Zobel

Gregory Zobel is an associate professor of Educational Technology at Western Oregon University.

Emoji and Social Media Paralanguage

Michele Zappavigna and Lorenzo Logi. 2024. Cambridge University Press. [ISBN 978-1-0091-7980-5. 268 pages, including index. $34.99 (softcover).]



Emoji and Social Media Paralanguage is an excellent guide and model for increasing research and understanding of emoji in online communications and platforms. Whether or not readers are familiar with Systemic Functional Linguistics (SFL) corpora analysis, discourse analysis—Michele Zappavigna's and Lorenzo Logi's framing theory and research methods—the book holds many rewards for those working in the fields of web-based media and content. First, while showing the multiplicity of ways emoji construct and co-create meaning, the authors also offer a detailed and nuanced framework for analyzing graphical paralanguage. Next, several chapters are readily excerpted for advanced communications, rhetoric, media, and linguistic undergraduate or graduate classes. Third, multiple chapters provide excellent models for emoji-focused mini-replication studies.

Chapter 1 defines paralanguage, frames emoji as paralanguage, and then discusses the authors' social semiotic perspective of emoji. This chapter also outlines the emoji corpora used for the research that is solidly excerptable.

Chapter 2 is fascinating in depth, range, and detail on semiotics and paralanguage for interested readers. It could potentially be used to educate students on how a research topic's technical aspects, or unexpected variables or factors (emoji and Unicode) can help re/define how a research data set (corpora) are built. As the authors show, the Unicode determined multiple aspects to their research, which is a valuable lesson on research practice. The authors discuss emoji technical complexities ranging from their development, encoding, and organization and covers guidelines from the Unicode Consortium and other power structure challenges. This chapter also offers insight into how much work and adaptation is needed when researching ubiquitous communication media.

Chapter 3 moves directly to framing and analyzing relationships between text and emoji. Chapters 4–8 present detailed analyses—with plentiful images and explanatory diagrams—that focus on emoji-textual relations as they generate textual meaning, ideational meaning, interpersonal meaning, negotiating social bonds, and communing around social bonds. Those

not familiar with linguistics, or SFL, might find these chapters challenging. These chapters' clarity in order, argument, evidence, and analysis are excellent models for researchers new to emoji or considering related topics.

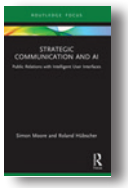
Chapter 9 is perhaps the most interesting to researchers and scholars working not in linguistics but related communication fields. It extends the authors' earlier chapters to connect with other visual and graphical paralanguage like memes and GIFs. When combined with Chapter 1 and Chapter 10, the Conclusion, these opening and closing chapters broaden how we think about, frame, discuss, analyze, and employ emoji.

Gregory Zobel

Gregory Zobel is an associate professor of Educational Technology at Western Oregon University.

Strategic Communication and AI: Public Relations with Intelligent User Interfaces

Simon Moore and Roland Hübscher. 2022. Routledge. [ISBN 978-0-367-62896-3. 102 pages, including index. US$26.99 (softcover).]



In *Strategic Communication and AI: Public Relations with Intelligent User Interfaces,* Simon Moore and Roland Hübscher ably discuss how an intelligent user interface (IUI) can be an important element in the future of digital communication with a focus primarily on public relations in a variety of applications.

The authors explain that an IUI is an interface that can use artificial intelligence to interact with a user. The reason artificial intelligence is used for interface design is to improve the efficiency and personalization of the interaction with the end user. Moore and Hübscher argue it is important to understand how the use of IUI could affect future communication and effectiveness as it relates primarily to public relations work. This could involve strategic communication via computers, displays, and phones as examples. It could also involve effective IUI-based communication in areas as diverse as community and corporate relations.

The scope of the topics covered in *Strategic Communication and AI* is impressive. For example, Moore and Hübscher discuss the use of IUIs in public relations that uses immersive communication. This includes virtual and augmented realities and an examination of the role, for example, of sight and touch. Visual worlds tie into sight with the idea that in the future "virtual and augmented spaces are going to be vivid and compelling" (p. 15). What are some examples in the world of public relations? One example is how travel and tourism companies might "engage with audiences and influencers by virtually immersing them in the experience of a destination" (p. 17). Another example is how companies could possibly "walk investors more persuasively through its latest restructuring" (p. 17). These examples just give an idea of the impressive scope and variety of topics covered in this book.

The scope of topics and related research in *Strategic Communication and AI* are also impressive as Moore and Hübscher debate important overarching questions such as "should governments regulate PR's adoption of IUIs" (p. 82). Here, the authors explain how in 2021 the European Commission "produced a proposal for an Artificial Intelligence Act" (p. 82) and go on to provide in detail some specifics of the proposal. Moore and Hübscher have indeed done their homework here due to the level of detail. The list of related reading and reference material is impressive in both this section on adoption of government regulations and throughout the book.

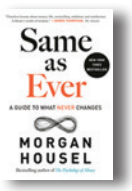
Anyone interested in learning about IUIs or artificial intelligence will find something of value in *Strategic Communication and AI: Public Relations with Intelligent User Interfaces*.

Jeanette Evans

Jeanette Evans is an STC Associate Fellow; active in the Ohio STC community, currently serving on the newsletter committee; and co-author of an Intercom column on emerging technologies in education. She holds an MS in technical communication management from Mercer University and undergraduate degree in education.

Same as Ever: A Guide to What Never Changes

Morgan Housel. 2023. Portfolio/Penguin. [ISBN 978-0-593332-70-2. 240 pages. US$30.00 (hardcover).]



Same as Ever: A Guide to What Never Changes is a breezy book about the general truths of human behavior that stay the same through the ages. Given that "risk can never be mastered" (p. 20) and that many of the

most consequential events both in the world and in our personal lives happen too unexpectedly to lend credence to any bold predictions about the future, Morgan Housel argues that we should therefore "base predictions on how people behave rather than on specific events" (p. 14). The self-contained chapters are well-suited to intermittent reading sessions, each focusing on a different observation about people and society that is as true today as it always has been, "same as ever."

While the book is written for a general audience, technical communicators may find that their biggest takeaway from *Same as Ever* is an appreciation for the power and influence of stories. As much as we would like to think that the best, most factual or complete information will find a way to reach the masses, oftentimes "the best story wins" (p. 62). For example, there have been plenty of ship sinkings that were deadlier than the *Titanic*, but most people struggle to name them because those sinkings don't have blockbuster movie stories behind them. Along those same lines, Housel notes that the bestselling anthropology book *Sapiens* by Yuval Noah Harari found massive success despite not contributing any new research to the field. It was thanks to Harari's ability as a storyteller and assembler of information that his words resonated with so many.

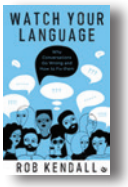
Arguably, *Same as Ever* is like *Sapiens* in that its strength and value as a book lies not in any groundbreaking insights but instead in its ability to gather and distill common knowledge into a highly readable format. The entire chapter "It's Supposed to Be Hard," for example, could easily be summed up as the unremarkable adage "no pain, no gain." As testament to his strength as a writer, Housel illustrates his admittedly banal lesson with the sensational and entertaining account of the Donner Party's infamous resort to cannibalism resulting from a failed shortcut. Some of the author's choices of anecdotes are more compelling than others. Warren Buffet's mentioning that Snickers was the bestselling candy bar both in 1962 and during the struggling 2009 economy strikes me less as an encouraging, profound insight into the nature of eternal truths and more like an underwhelming appeal to authority, yet Housel thought this was a powerful enough anecdote to open the entire book. Still, I found that there were enough nuggets of wisdom and inspiration to make *Same as Ever* worthy of a long afternoon.

Josh Anderson

Josh Anderson, CPTC, is an Information Architect at Paligo. Josh was an English teacher in Japan and an SEO Specialist in the Chicagoland area before earning a Master of Information at the University of Toronto.

Watch Your Language: Why Conversations Go Wrong and How to Fix Them

Rob Kendell. (2023). Watkins Publishing. [ISBN 978-1-78678-789-7. 224 pages. US$18.95 (softcover).]



Rob Kendall's book *Watch Your Language: Why Conversations Go Wrong and How to Fix Them* is a foundational look into the learned art of conversations. This aptly titled guide specifically focuses on identifying why they may go wrong and what we can do to remedy the aftermath.

Kendell opens with a look into four outcomes of conversations gone wrong, upon which guidance for the rest of the book is structured. He defines these outcomes as (pp. 2–3):

- "The Tangle – where crossed wires lead to uncertainty and confusion, uncoordinated action and frustrated expectations."
- "The Big Argument – where a convivial start spirals out of control and into a bitter row."
- "The Bad Place – where the conversation you were having with someone has gone horribly wrong and you're in the mire."
- "The Lockdown – where feelings and thoughts are internalized…leading to an implosion."

From then on, each chapter "is [a] short and self-contained [focus] on a specific topic with clear steps for action and a key lesson" (p. 4). Chapters with actionable titles range in topic from "Identify the Subtext" to "Ask What's Missing and Needed". To introduce the chapter, a short section of social research or Kendell's personal experiences give additional context for upcoming information.

The main portion of the chapter begins with an example conversation from hypothetical characters, moving into an additional explanation of what outcome might be occurring. The "What To Do" section answers how the characters should have handled the situation and what we can do practically in our lives. Finally, the

chapter ends with a short lesson, a perfect one-liner for the reader to take with them beyond the book.

Though the chapter sequence is repetitive, *Watch Your Language* is set up as a quick reference for specific situations and tips on how to handle them. At the beginning of the book, Kendell states, "I'd recommend reading the whole book and then returning to the chapters that you feel are most useful for you" (p. 4). With actionable chapter titles, readers can easily reference back to chapters they most need and find ways to work with others (or themselves) to better use the art of conversation. And, as technical communicators often work in various conversation settings, this guide is an easy in context reference.

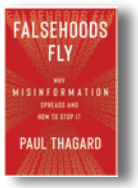
Watch Your Language is a highly actionable guide for working with social situations in a variety of settings. With short, succinct chapters full of golden advice, all people would gain a better understanding of how to have better conversations, and work through situations in which conversations go wrong.

Lauren Rigby

Lauren Rigby is an STC student member at the University of Alabama in Huntsville. She is a first-year graduate student who is pursuing a master's in English with a certificate in technical communication. Lauren is currently working towards becoming a technical communicator in the greater Huntsville area.

Falsehoods Fly: Why Misinformation Spreads and How to Stop It

Paul Thagard. 2024. Columbia University Press. [ISBN 978-0-231-21395-0. 358 pages, including index. US$25.00 (softcover).]



Falsehoods Fly: Why Misinformation Spreads and How to Stop It takes its title from Jonathan Swift: "Falsehood flies and truth comes limping after it." Since Swift's day, technology has greatly increased our ability to learn accurate things about the world, but it has also accelerated the spread of misinformation to the point where, as in the case of the recent pandemic, it can kill millions.

To help us better deal with the problem, Paul Thagard, an emeritus professor of philosophy, offers a comprehensive theory and framework for understanding how information is generated and spread. He calls it the AIMS theory for its four main components: acquisition, inference, memory, and spread. Acquisition covers how we acquire information by interacting with the world, inference covers drawing conclusions from observations, memory covers storing and retrieving information, and spread covers disseminating what has been learned. For each area, Thagard describes how it can function well or poorly. For example, he shows how things can go awry through confirmation bias—looking for evidence that favors a predetermined position—or through motivated reasoning where people allow their fears, hopes, tribal membership, or preference for a given outcome to trump good information practice.

The problem of misinformation due to human error or carelessness is bad enough. The problem of disinformation—deliberate falsehoods—spread by irresponsible and malicious actors is often worse. Dishonest political and industry propagandists hide or twist evidence or "just make stuff up" for political or financial gain. Both can spread rapidly via social media platforms more concerned with revenue and engagement than accuracy and by other means.

Having laid out his theory, Thagard demonstrates its usefulness by applying it to four major areas rife with misinformation: the COVID-19 pandemic and vaccine hesitancy, climate change, conspiracy theories and political propaganda, and inequality and social justice matters.

To illustrate how the spread of misinformation might be combated, Thagard turns his attention to the news and propaganda flowing out of the Russia/Ukraine war. Against this background, he covers a range of techniques for misinformation self-defense, including replacing misinformation with good information, employing "motivational interviewing" which he defines as "using empathy and open-ended questioning to change attitudes and behaviors" (p. 286), and applying various critical thinking tools to become less susceptible to misinformation and its purveyors. Finally, he notes, addressing misinformation may require mending social media platforms and applying political and legal remedies to the worst offenders.

Rounding out his argument, Thagard closes with a series of critiques defending the idea of objective reality against various claims for a relativistic, post-truth world, such as the idea that all reality is socially constructed, or that we live in a virtual universe.

For those wanting more, *Falsehoods Fly* includes an extensive bibliography and a glossary of key concepts. Online supplements are available for those who want to dive into academic matters, or to take advantage of live links to references and notes.

Patrick Lufkin

Patrick Lufkin is an STC Fellow with experience in computer documentation, newsletter production, and public relations. He reads widely in science, history, and current affairs, as well as on writing and editing. He chairs the Gordon Scholarship for technical communication and co-chairs the Northern California technical communication competition.

Amplifying Voices in UX: Balancing Design and User Needs in Technical Communication

Amber L. Lancaster and Carie S. Tucker King, eds. SUNY Press. [ISBN 978-1-4384-9674-0. 480 pages, including index. US$99.00 (hardback).]

Amplifying Voices in UX: Balancing Design and User Needs in Technical Communication is the culmination of years of discussion about the diverse and sometimes competing audiences whom we address within our field. Specifically, who is our audience? What level of usability is "enough" to launch a product or website? When do we consider secondary and even tertiary audiences and how do we include them? In this edited collection, Amber L. Lancaster and Carie S. Tucker King seek to address these questions through a social justice lens.

The goal of *Amplifying Voices in UX* is to "extend UX design practices beyond translating and tailoring for local users to broader global users, while considering the diversity of user uniqueness, customization, desires, all stakeholders, and social needs" (p. xiii). This is an ambitious agenda in a corporate environment that tends to be driven by profit and the "best fit" for the general user over customization to adapt to the needs of the few. Fortunately, Lancaster, Tucker King, and the chapter authors make a compelling case for what they term *equillibriUX:* a state of balance between localization and usability and user experience (UX) (p. 6).

The book is divided into three sections, each addressing different stakeholders. Part 1: Pedagogical Topics addresses the ways in which instructors can design a curriculum within technical and professional communication that "emphasizes balance and empathy and integrating these values into our classrooms" (p. 19). Part 2: Rhetoric of Health and Medicine Topics emphasizes current developments in health communication such as user-centered tools and ways in which medical practitioners could foster patient-centered discourse. Finally, Part 3: Equality, Access, and Social Justice Topics presents "issues of equity, safety vulnerabilities, and civic engagement" (p. 325), such as the usability of ride-sharing apps and institutional transformation within a political campaign.

This tripartite focus is a strength of *Amplifying Voices in UX* in that it lets the reader consider usability within the context of a particular rhetorical situation. Usability is situated and cannot be discussed without consideration of the audience and the exigence of the application. However, Part 3 felt less focused and more like the miscellaneous bin of the book because the chapters lacked a cohesive central topic.

Amplifying Voices in UX would be a valuable resource for technical communicators and academics because there is not a single area within our field that UX doesn't impact. The chapters lean toward academic rather than practical discourse, but the terms are clearly explained. The topics are sufficiently situated in real-world contexts to make this text a valuable addition to a graduate course in usability, a primer for current thought in UX for an academic, or as food for thought for practicing technical communicators.

Nicole St. Germaine

Nicole St. Germaine is a Professor of English and the Coordinator of the Technical and Business Writing Program at the Natalie Z. Ryan Department of English at Angelo State University.

Learning to Imagine: The Science of Discovering New Possibilities

Andrew Shtulman. 2023. Harvard University Press. [ISBN 978-0-67-424817-5. 354 pages, including index. US$35.00 (hardcover).]

Knowledge is king as outlined in *Learning to Imagine: The Science of Discovering New Possibilities.* Through three well-defined sections, Andrew Shtulman proves that imagination is something that thrives

through knowledge expansion and collaboration—experiences that come with age and education. This contradicts the assumption that children are more adept in creativity.

Shtulman brings to light how children cannot fully immerse themselves into imaginative worlds due to their limited knowledge. They insist on grounding their thoughts in reality and are unable to process universes that extend beyond their beliefs. For example, when children engage with fantasy and magic, they assign existing rationale to determine their level of engagement. Shtulman provides examples from pop culture, such as Harry Potter and Star Wars, to demonstrate the progression of character skill development—establishing plausibility. Children are more likely to believe incremental strategy and success, rather than swinging to ultimate power and victory of magical main characters. Natural progression and education make it so that children can establish plausibility that magic could be real in a fictional setting.

There is also a difference between the exploration of curiosity and imagination. These two can often be conflated and might lead to the assumption that children are greater at imagination than adults. As children are learning the world and boundaries around them, they are often asking the "how," embarking on the exploration of curiosity. Through this line of questioning, they are determining how an event or item is plausible and building their understanding for future use. This exploration encourages collaboration between others and provides the tools to take a step toward creativity and imagination.

As adults, we find success in collaboration. We brainstorm ideas and can find ways to work smarter and more productively together. When we establish siloed experiences, we lose the imaginative ability and focus solely on hitting a deadline through relying on previous work that proved successful. Shtulman shares that examples can allow for creativity, but there is a flipside to becoming stagnant and not delivering innovation.

As I was reading this, I thought about speaking with friends who work in social media content development. They turn to their feeds to gain inspiration for their audience, only to realize they have spent hours endlessly scrolling and feeling overwhelmed with possibility. Their creativity feels drained, and they are back at square one, but now with depleted enthusiasm. This reflects how Shtulman discusses examples providing opportunity while simultaneously limiting how we can make it our own and go beyond the template. These friends often find they develop their best work when setting time limits for scrolling platform feeds and engaging in real-time conversations with others to share ideas.

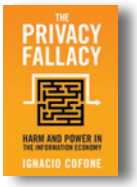
Learning to Imagine is an insightful read on how knowledge is the foundation for imagination and how paired with collaboration, innovation, and success can thrive.

Siobhan Patterson

Siobhan Patterson is an STC member and is a communications consultant based in Auburn, AL. She has experience in working in telecommunications, fintech, sports communication, and higher education. Siobhan also serves as secretary on the local young professionals' board and participates in her area bookstore challenges.

The Privacy Fallacy: Harm and Power in the Information Economy

Ignacio Cofone. 2024. Cambridge University Press. [ISBN 978-1-316-51811-3. 280 pages, including index. US$120.00 (hardcover).]



When we tick the "I agree" box on a website, we believe we are signing a traditional contract ensuring that our information remains between us and the site, and that it cannot be shared with other sites without our further, express permission. In reality, the agreement does not prevent subsequent exploitation of the information by either the host site or third parties, who are free to use it as they please. Under the current legal regimen, the agreement we think protects our information actually enables its misuse.

Consider a recent case involving Facebook. Ordered by a court to remove an "'ethnic affinity' filter" that identified users by "race, gender, nationality, and other protected characteristics", Facebook complied, but that did not "eliminate discrimination; it just hid it," because advertisers could still filter indirectly—if not by "Latinx," then by "who likes Telemundo." By aggregating user information, Facebook can find ways to "discriminate while complying with antidiscrimination and privacy law" (p. 3).

The contractual consent agreement amounts to a "privacy fallacy" (p. 7) because we believe the procedural rules of a contract will protect us, when in practice "they're insufficiently related to preventing harm" (p. 110). Personal information that "appears innocuous today" can be "harmful in the future" because, as in the Facebook example, we "can't reveal just one thing without letting companies learn other things" (p. 8). The consequences of an initial, necessary, and straightforward transaction—providing basic information for permission to use a particular site—may actually be deeply and permanently injurious, and in ways the original user cannot foresee.

The solution, Ignacio Cofone argues in *The Privacy Fallacy: Harm and Power in the Information Economy,* is to shift the law from "a contracts paradigm" to "a torts paradigm" that imposes liability for violating "individual and social privacy" (p. 167) on the companies exploiting the data. A key premise is that information is "inevitably linked to us, like our bodies are," and "like our bodies, are part of us, and what people do with them after an agreement impacts us, unlike what people do with commodities we give them" (p. 65).

Liability law introduces a self-correcting legal mechanism that shifts the burden to the data exploiter and avoids the impossible task of defining a set of procedural rules capacious and precise enough to foresee all possible abuses. Liability law also acknowledges that privacy harm isn't binary, but "sits on a spectrum" (p. 19) and allows for adjusting damages on a case-by-case basis to achieve a just resolution.

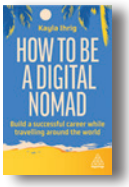
With the advent of artificial intelligence, exploitation of private information increases exponentially and recedes even further from human control. The system operates globally, relentlessly, and autonomously, reinforcing the need "to curb privacy harm" (p. 172) by reclassifying online information agreements under tort law. Cofone's recommendations could not be more relevant or timely.

Donald R. Riccomini

Donald R. Riccomini is an STC member and Emeritus Senior Lecturer in English at Santa Clara University, where he specialized in engineering and technical communications. He previously spent twenty-three years in high technology as a technical writer, engineer, and manager in semiconductors, instrumentation, and server development.

How to Be a Digital Nomad: Build a successful career while travelling around the world

Kayla Ihrig. 2024. Kogan Page. [ISBN 978-1-3986-1305-8. 230 pages, including index. US$15.99 (softcover).]



Have laptop, will travel. If you read *How to Be a Digital Nomad: Build a successful career while travelling around the world*, you may be tempted to follow in Kayla Ihrig's footsteps and trade in your 9-to-5 job for a one-way ticket to the wider world. Equal parts rah-rah, how-to, and beware, the book tackles the rewards and challenges of the digital nomad lifestyle. Ihrig dispenses colorful stories and counsel with a degree of good sense and compassion that can only come from experience.

The author provides a comprehensive guide on how to succeed in a location-independent job while exploring the world. Topics include where to look for remote work, how to prepare for going overseas, choosing where to stay, setting up your work life abroad, balancing work and travel, and preserving your mental health. She devotes an entire chapter to planning and managing finances abroad, with tips on how to estimate expenses when researching a new country and advice to always carry U.S. dollars.

Positioning herself as "your friend who works online and travels," Ihrig acts as cheerleader and coach but does not shy away from the pitfalls of living and working abroad. "Every travel story starts the same: with something going sideways. It's part of the adventure," she writes (p. 199). She devotes an entire chapter to when things go wrong—whether technical problems that can bring work to a standstill, unexpected health problems, crime, or the burden of stress and loneliness. And yet, Ihrig identifies the biggest threats to travel and career plans as your own habits: lack of clarity, procrastination, and distracted working. She provides solid tips to combat these common saboteurs.

Remote work hygiene is another topic Ihrig explores in depth, which includes the all-important fundamentals of establishing file-naming conventions, staying on top of your inbox, being organized, and working ahead of schedule. "This is the only promise that I'll make to you in this entire book," Ihrig writes. "I can 100 per cent guarantee that poor remote work hygiene will detract from the enjoyment of your travels" (p. 99).

How to Be a Digital Nomad is an overall endorsement of the lifestyle, albeit told through a series of cautionary tales. The book's beauty is in its smallest helpful details that explore all angles of digital nomadism, preparing new digital nomads to navigate problems and ascend peaks not yet imagined.

If you're considering becoming a digital nomad, let this book help you get ready for one of the great adventures of your life with all its twists and turns. After all, as Ihrig reminds readers, "No one regrets traveling."

Bonnie Denmark

Bonnie Denmark is an STC Member and Assistant Professor of Business and Technical Writing at Western Connecticut University. She has worked internationally as an educator and multimedia curriculum developer and made plenty of mistakes that this book would have helped her avoid.

Life Before the Internet: What we can learn from the good old days

Michael Gentle. 2023. John Hunt Publishing. [ISBN 978-1-80341-388-4. 138 pages. US$15.95 (softcover).]

Michael Gentle examines everything from Amazon (the company, not the river) to penmanship in *Life Before the Internet: What we can learn from the good old days*. Each chapter of the book covers a specific customary practice or lack of in the past and how that impacted people for the better. I found the chapters "People Gave Us Their Full Attention" and "We Wrote Letters" to be particularly compelling accounts of skills that have been lost to time.

In "People Gave Us Their Full Attention," Gentle talks about how in the pre-internet era, people's attention wasn't divided the way it is now. For example, "a restaurant was the one place where you were virtually guaranteed people's full attention because it was impossible to be interrupted – except, of course, by the waiter coming round to ask if everything was okay" (p. 53). Now, our attention is divided by our laptop and cell, which deliver calls, texts, and notifications from various sources, and so is everyone around us. Further, these devices also give us quick access to a camera and social media allowing us to capture and share images and reviews of our meals for those who aren't with us to appreciate. Gentle concludes, "Technology has effectively driven a wedge between our need to be connected and the attention we are willing to give to others" (p. 54). While technology has created the means for our divided attention, the true loss is that we're rarely fully present.

In the "We Wrote Letters" chapter, Gentle discusses the near-instantaneous nature of communication today compared to the pre-internet era in which communication took time and forethought. "Before the internet, you kept in touch by writing letters. The process took weeks rather than minutes. Indeed, the very slowness of it all made letters very personal – and also valuable, because they couldn't just be deleted" (p. 62). In the pre-internet era, communication was intentional: you thought about your words, wrote them down by hand, mailed them, and waited for a reply. When I read this chapter, I instantly longed to write letters to those I care about. But in a hyper-connected world, it's an unrealistic communication form unless I can find someone willing to actively participate in this endeavor with me. Until I find such a person, I will continue writing hand-written thank-you and thinking-of-you notes to friends and family. I'm convinced that mail should be for more than bills and junk mail.

Gentle does an excellent job of breaking down some of the skills lost to time and technology and explaining why they are important. I would have liked him to also cover practical ways we might introduce these skills back into our lives and how technology has improved some things. With that said, *Life Before the Internet* is a good read for those of us who remember the pre-internet era (even if just barely) and those who never experienced it.

Sara Buchanan

Sara Buchanan works at London Computer Systems, a property management software company, in Cincinnati, OH. In her free time, she's an avid reader, enjoys cooking, and doting on her cats: Buffy and Spike.

The Drive for Knowledge: The Science of Human Information Seeking

Irene Cogliati Dezza, Eric Schulz, and Charley M. Wu, eds. 2023. Cambridge University Press. [ISBN 978-1-009-01304-8. 292 pages, including index. US$35.99 (softcover).]

The Drive for Knowledge: The Science of Human Information Seeking comprises twelve scholarly articles describing the human need to seek knowledge and information. The book has three parts: Part I covers "What Drives Humans to Seek Information?;" Part II focuses on "How do Humans Search for Information?;" and Part III includes articles that focus on "What Machinery Supports the Drive for Knowledge?"

This book strives to answer core questions about our drive as humans to seek information, such as, "Where does this desire come from?," "What is its purpose?," and "How does it operate?." The editors and the contributing authors try to answer these questions by including articles using the latest in tools and methodologies from computational models of human information-seeking behavior to neuro-imaging techniques.

In one article, "From Curiosity to Interest: Accumulated Knowledge Supports Long-Term Persistence of Information-Seeking Behavior," Ed Donnellan, Michiko Sakaki, and Kou Murayama provide a brief overview of two research traditions—interest research and curiosity research—and then attempt to provide a framework to connect their strengths. On one hand, interest research is primarily an educational perspective that is qualitative in nature and seeks to discover facts about information-seeking behavior over the long-term. On the other hand, curiosity research is a perspective that is quantitative in nature and seeks facts about one-time information seeking.

Both traditions focus on people's motivations (not those based on immediate, extrinsic incentives such as food or money), and try to explain the relationship between a person's pre-existing knowledge and their information-seeking. The authors propose a new framework that incorporates reward-learning and knowledge acquisition. Their main points are that knowledge accumulation: (1) creates awareness of gaps in knowledge; (2) increases information-seeking skills (or perceived skills); and (3) increases the expectation of reward value of new information (meaning that greater value will be applied to information pertaining to an already existing knowledge base).

Another article, "Edgework: Viewing Curiosity as Fundamentally Relational" by Perry Zurn, et al., begin by asking "What is curiosity?" Their theory is that curiosity is not simply a desire for knowledge to fill in information gaps, but it is a grasping for information that fundamentally connects relationships between ideas in the mind and things in the world. Theirs is a connectional model. In their research, curiosity is the "edgework" of the knowledge-building process. They think that curiosity as edgework also works nicely with the theory of "compression progress" (p. 265) or that we, as humans, enhance the compactness, efficiency, and flexible use of knowledge and may prioritize this type of knowledge as we continue to develop and age.

Other articles provide a wide variety of theoretical perspectives on memory, reinforcement and human social learning, attention control, and even what makes a good query. *The Drive for Knowledge* is best suited for learning and development practitioners within technical communication.

Charlotte Weddington

Charlotte Weddington is an STC member and has been a technical communicator in the manufacturing sector since 2015. She has a background in ISO 9001 documentation and currently works for Hunter Douglas as a Technical Writer.

Better Practices: Exploring the Teaching of Writing in Online and Hybrid Spaces

Amy Cicchino and Troy Hicks, eds. 2024. The WAC Clearinghouse and University Press of Colorado. [ISBN 978-1-64215-224-1. 504 pages. US$0.00 (e-book). Free download from WAC Clearinghouse website at https://wac.colostate.edu/books/perspectives/better/]

Better Practices: Exploring the Teaching of Writing in Online and Hybrid Space investigates effective writing teaching strategies for digital and hybrid learning environments. It emphasizes the importance of moving beyond traditional "best practices" to embrace a nuanced approach that acknowledges the diverse realities of technology-based instruction. This research aims to develop flexible, inclusive, and student-centered strategies in response to the unique challenges of online and hybrid writing

instruction. The article adopts a collaborative model, pairing experts with newcomers in the field of online writing instruction. This approach fosters dialogue, the exchange of ideas, and open collaborative scholarship. The hope is to contribute to the field of writing studies by offering insights and strategies that help teachers and students excel in the digital age.

The research identified gaps in the understanding of online writing instruction (OWI) and online literacy instruction (OLI), as well as their best practices. Previous literature often focused on idealized "best practices," neglecting the complex realities of their implementation in digital environments. This article proposes refined practices as a solution. These practices, rooted in OWI/OLI principles, emphasize students' active participation in their learning process. Such practices are crucial for developing an effective, equitable writing pedagogy that adapts to diverse student needs and addresses the specific challenges of online and hybrid learning.

Amy Cicchino and Troy Hicks focus on informed practices shaped by a deep understanding of the field. Their solutions consider students' diverse needs as well as the complexities of online and hybrid learning environments. This student-centered approach is an improvement over previous works that often overlooked the role of learners. This book organizes itself around concepts that direct a range of educational experiences, offering readers various avenues to investigate particular OWI/OLI themes and goals. This work's scholarly contributions lie in its exploration and advocacy of improved practices for teaching writing in online and hybrid learning environments. The authors propose a nuanced approach that addresses the complexity of OWI and OLI, emphasizing accessibility, inclusivity, and intentional support for student collaboration. This collaborative effort addresses the needs of the field while challenging the traditional expert-beginner dichotomy and providing diverse pedagogical experiences. By integrating refined practices, collaboration, and a focus on accessibility and inclusiveness, Cicchino and Hicks effectively address existing problems in online writing instruction. While the article does not delve into simulation-based research or specific methodologies, it offers valuable insights into how to enhance writing instruction in online and hybrid spaces.

Better Practices is a valuable resource for anyone interested in transitioning from traditional "best practices" to a nuanced, student-centered, collaborative, and technology-aware approach to creating effective and equitable online and hybrid writing instruction. The book is well-written and easy to follow, making it accessible to a wide range of readers.

Danang Handoko Belut Saputro

Danang Handoko Belut Saputro is an awardee of the Lembaga Pengelola Dana Pendidikan (LPDP) PK-176 scholarship for a master's degree in information technology at the Universitas Gadjah Mada in Indonesia. He is grateful to LPDP for providing complete financial support for his master's degree and this book review.

The Visual Elements–Design: A Handbook for Communicating Science and Engineering

Felice C. Frankel. 2024. University of Chicago Press. [ISBN 978-0-226-82916-6. 186 pages. US$20.00 (softcover).]

Felice C. Frankel is back with a second book in her Visual Elements series, *The Visual Elements–Design*. Like its predecessor on photography, Frankel wrote this for science and engineering professionals to help them learn to communicate their work effectively to a broad range of audiences. *The Visual Elements–Design* is an outstanding resource with thoughtful analysis of the best practices intended for anyone interested in improving their communication through information visualization.

The introduction sets up the content well and explains why visuals are important in publishing and presenting scientific research. Chapter 1, "Listing and Sketching," covers the value of planning out your ideas before you get started and explains that when you jump into the software first, it "will influence your thinking" and "the program's defaults [will] push you toward certain layouts" (p. 12) , which is excellent advice. Chapter 2, "Case Studies," provides a vast collection of examples that focus thematically on structural, conceptual, and numerical graphic representations. These case studies are beneficial because, besides offering a wealth of successful solutions, they also include the various iterations the designs went through as they determined the final form and why they decided to make changes. This shows the deep thought and analysis that goes into successful design.

Chapter 3, "Graphic Submissions," includes more examples provided by friends, colleagues, and designers or scientists known by Frankel, with the stories behind the design in their own words. This section is organized by color, composition, layering, labeling, and refining. The last chapter, "Posters and Slide Presentations," was a pleasant surprise to see; the design of research posters and presentations, especially in the academic setting, seems to be overlooked, but here again, the advice about the importance of design in these settings is spot on. Frankel continuously reminds readers, "If graphics play such a critical role in publishing…why are they not taken more seriously?" (p. 184).

Like the first book in the series, the contents of *The Visual Elements–Design* are very approachable. The handbook's heart is the abundant examples with clear explanations of each design decision, and while Frankel gives specific details about what she thinks works and doesn't work in the various iterations, she also challenges the reader to think about whether they agree with her assessments, acknowledging that there is a level of subjectivity in design.

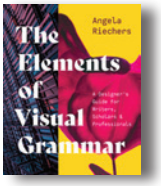
While not covered in this handbook, Frankel does mention the discussion on ethics from *The Visual Elements–Photography* book. You would need to read both books in the series to understand these concepts. Thankfully, they are both quick reads with beneficial content. Also similar to the first book, this is a helpful guide to keep handy to refer back to when needed.

Amanda Horton

Amanda Horton holds an MFA in Design and teaches graduate and undergraduate courses at the University of Central Oklahoma (UCO) in design history, theory, and criticism. She is also the director of the Design History Minor at UCO.

The Elements of Visual Grammar: A Designer's Guide for Writers, Scholars & Professionals

Angela Riechers. 2024. Princeton University Press. [ISBN 978-0-691-23122-8. 222 pages, including index. US$24.95 (softcover).]



The Elements of Visual Grammar: A Designer's Guide for Writers, Scholars & Professionals is a book about graphic design crafted for people who haven't studied graphic design. The book's purpose is to teach the big principles of design to those who need on-the-job strategies for using images and illustrations combined with text. Given the simple but thorough explanations and the plethora of full-color images, the text succeeds in its mission.

Angela Riechers broke the book into two sections: the basics and strategies. The Basics section covers the "grammatical" terms of graphic design. In Chapter 1, you learn how to choose the right image for a text, giving particular attention to why and how images pull in readers. Here, she demonstrates what story an image tells and what qualities of the image impact the viewer. Riechers offers six "baseline rules" for choosing an image, with supporting sample images and their contexts. She ends the chapter with questions to help strategize your image-selection process.

Chapters 2 and 3 explore image composition and action ("active surfaces") with topics from hierarchy, balance and scale to rhythm, movement, and point of view. Chapter 4 covers color theory by acknowledging the complexities of color while reassuring the reader that "it isn't necessary to know all the voluminous information on color to use it wisely" (p. 75). The information comes to the reader in small, easily-consumable chunks, with bullet lists, clear and simple definitions, and images that support the text.

The Strategies section covers the purpose of those graphical elements. Is a photo chosen to convey information or to "shock or outrage" viewers? Riechers examines photographic work and illustrations separately here to illuminate the differences of each medium. Use photographs for journalism, and illustrations to diagram or visualize data; both have artistic purposes. She includes lists of questions to help focus the decision-making processes that are practical and immediately useful, again giving the target audience what it needs.

The final chapter uses humor to integrate all the lessons. When choosing photos, Riechers writes that "the first pancake is almost always a throwaway" (p. 185), meaning don't go with the first choice and play a little to experience the impacts of other images, too.

The only minor issues with the text are that the table of contents lists only the chapter titles and not the section headings, while the index uses a run-in style that makes it awkward to find things.

Riechers writes directly and openly in a conversational tone: "With that said, always pull a wider selection than you think you'll need […], but

don't go crazy" (p. 17). This approach to the writing doesn't shy from the technical: She defines and uses terms like "chromostereopsis," which is the "illusion of vibration" caused by colors. Riechers prose is easily readable and comprehensible when she talks about color theory, hue, saturation, and other graphical design terms. Given the target audience, her use of a friendly tone and style is an excellent choice.

Kelly A. Harrison

Kelly A. Harrison, MFA, teaches technical communication at Stanford University and has taught a range of writing courses at San José State University. Before her career as an academic, she spent over 15 years in computer software as a technical writer, editor, and manager. She writes, edits, and consults, and she is working on a masters of liberal arts at Stanford University.

Science v. Story: Narrative Strategies for Science Communicators

Emma Frances Bloomfield. 2024. University of California Press. [ISBN 978-0-520-38082-0. 288 pages, including index. US$29.95 (softcover).]

Narratives are powerful. They make information easier to understand and remember, and they shape what we believe and how we act in the world. But they can also stir our emotions, and they can sometimes lead us astray. For this reason, some in science have come to shun narrative—"Don't tell me a story, just show me the data." Hence the book's title.

In *Science v. Story: Narrative Strategies for Science Communicators*, Emma Frances Bloomfield argues that this antipathy to arguing via narrative leaves science communicators at a disadvantage. When forced to contend with a stirring narrative—a tale of biblical creation, an seductive conspiracy theory, or disingenuous claims from corporate-backed "merchants of doubt,"—a dispassionate presentation of scientific findings, when not backed by a strong narrative, will often fail to gain traction.

To hold up their end of the discourse, science communicators need to become better at tailoring narratives to meet the needs of specific audiences. Toward this end, Bloomfield offers a framework that enables one to look at a narrative's elements—content, character, action, sequence, storyteller, and scope—along with how they are implemented, and map them onto a web for further analysis. This framework allows one to play with how the story is told and judge how it might resonate with a particular audience: could it be improved by introducing relatable characters, telling it from a different viewpoint, or using a more local focus, and so on? While Bloomfield stresses that no one size fits all, in general she recommends using a mix of personalized elements, concrete details, and big-picture elements. Personal stories and concrete examples are easier for most audiences to grasp and relate to, while more expansive elements add a degree of universality and broad importance.

Bloomfield uses her own tool to describe and analyze the discourse surrounding four scientific controversies: the COVID-19 pandemic, climate change, evolution, and vaccination. She provides excellent summaries of the complex discourse surrounding each. Quoting from scientific sources and from those offering rival narratives, Bloomfield contrasts how the various rivals have attempted to make their case. For the most part, science attempts to avoid emotion, and argues using facts, logic, charts, and statistics. While the proponents of rival narratives often seek to undercut the science with various strategies, some of them disingenuous—emotional appeals, cherry-picked citations, personal attacks on the storyteller ("flip-flop Fauci"), charges of political bias or financial corruption, and so on. Science communicators need to be prepared for such rival narratives, tropes, and tactics.

Bloomfield reminds us that to tell better stories, science communicators also need to be better listeners. Not all rival narratives are disingenuous. Some rival stories may need to be listened to, such as those from indigenous and marginalized communities that may contain truths that dominant narratives have overlooked. Listening may allow rivals to at least agree on some common ground.

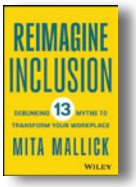
Science v. Story is original, well argued, and well worth consideration, not just for scientists, but for anyone who participates in helping science hold up its end of the discourse that shapes our lives.

Patrick Lufkin

Patrick Lufkin is an STC Fellow with experience in computer documentation, newsletter production, and public relations. He reads widely in science, history, and current affairs, as well as on writing and editing. He chairs the Gordon Scholarship for technical communication and co-chairs the Northern California technical communication competition.

Reimagine Inclusion: Debunking 13 Myths To Transform Your Workplace

Mita Mallick. 2024. John Wiley & Sons. [ISBN 978-1-394-17709-7. 268 pages, including index. US$28.00 (hardback).]



Mita Mallick notes that she knows what it is like to feel left out. She explains this is why she devoted her professional life to encouraging inclusion in the workplace. Mallick was employed as a multicultural marketer in the beauty and consumer goods space, then worked with companies such as Carta, AVON, Pfizer, and Johnson & Johnson to promote inclusion. Her focus in *Reimagine Inclusion: Debunking 13 Myths To Transform Your Workplace* is to offer practical strategies to promote inclusivity and show how what she calls myths can hold back an organization from being inclusive.

An example of a myth, as explained by Mallick, concerns apologies related to incidents involving inclusion. The myth is that "we do not owe anyone an apology." Instead, an organization should recognize when an apology is in order and provide one. A real apology is related to a statement recognizing remorse over something bad happening and real actions related to preventing the problem in the future. In the cases Mallick discusses, what is bad is that inclusion was not evident, exclusion happened, and harm occurred.

Mallick explains how Starbucks, Sesame Street, Sephora, and other organizations effectively handled apologies when harm occurred due to a lack of inclusion. Sephora, for example, issued an effective statement of apology. Sephora also followed up by providing a certain percentage of products for black and brown customers. Sephora also hired a certain percentage of black and brown employees and held sessions on inclusion. Mallick considers their statement and follow up to be a good way to handle an apology recognizing that "something bad" happened.

Mallick also explains in *Reimagine Inclusion* that inclusion is good for business. She ably provides data about this to help explain why inclusion is an important issue in the business world today and in society in general.

A leader or manager looking to encourage inclusion in the workplace could benefit from reading about helpful and specific actions in *Reimagine Inclusion*. A student, teacher, researcher, or anyone interested in the topic of diversity, equity, and inclusion will also find something of interest.

Jeanette Evans

Jeanette Evans is an STC Associate Fellow; active in the Ohio STC community, currently serving on the newsletter committee; and co-author of an Intercom column on emerging technologies in education. She holds an MS in technical communication management from Mercer University and undergraduate degree in education.

I Cannot Control Everything Forever: A Memoir of Motherhood, Science, and Art

Emily C. Bloom. 2024. St. Martin's Press. [ISBN 978-1-250-28568-3. 334 pages, including index. $29.95 (hardback).]

Anyone involved in practicing, researching, or teaching about technical communication (and consequently wanting to connect effectively with their audience) should find of interest how Emily C. Bloom insightfully discusses in *I Cannot Control Everything Forever: A Memoir of Motherhood, Science, and Art* that a person in today's world increasingly relies on scientific and technical data. Also of interest would be Bloom's look at the history of science and how scientific discoveries have made us rely so much on scientific data. This insight can help the technical communicator better connect with an audience and aim to provide to a user information that is clear and useful.

How did the world get to be so data-driven and interested in science and technology? In an attempt to answer this question, Bloom looked at snippets of the history of science to help make sense of the current world as she includes such subjects as the identification and treatment of diabetes, and development of

ultrasounds touching many lives with their technology and related data. As to why people today are data-driven and interested in technology, consider how a home Covid test—now an option but not always so—provides a technology and data of life-changing importance.

In a section on the history of science, Bloom discusses Alexander Graham Bell's important work with the hearing impaired. Her description of Bell's work is especially engrossing as she explains how his mother and wife were both deaf and an influence on his work. Bloom also points out in an interesting narrative that Bell had talent not only in science but also in poetry, music, and art. Her narrative brings a humanistic perspective on her observations as she reflects on a combination of interests in science, literature, and art. *I Cannot Control Everything Forever* is what can be called a meditation on science that also brings in pieces of art.

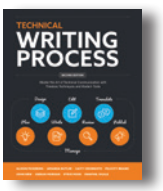
Bloom is the mother of an exceptional child as she notes that the term "scientific motherhood" (p. 12) applies today as she needs to often look at scientific data to make decisions concerning the care of her child. Being a great communicator and engrossing storyteller, Bloom has an interest in the intersection of science and art—a great perspective for someone involved in technical communication and looking at how best to serve today's often data-driven audience.

Jeanette Evans

Jeanette Evans is an STC Associate Fellow; active in the Ohio STC community, currently serving on the newsletter committee; and co-author of an Intercom column on emerging technologies in education. She holds an MS in technical communication management from Mercer University and an undergraduate degree in education.

Technical Writing Process: Master the Art of Technical Communication with Timeless Techniques and Modern Tools

Alison Pickering, et al., ed. 2024. (2nd ed.) Boffin Education. [ISBN 978-0-9941693-2-7. 494 pages. US$34.95.(softcover).]



Technical Writing Process: Master the Art of Technical Communication with Timeless Techniques and Modern Tools, 2nd ed. provides a comprehensive overview of the steps in many technical writing processes. The book divides information into 11 sections with the first describing the profession and offering insights about starting or advancing your career. It includes testimonials from current technical communicators. The remaining sections explain the tactical processes and flow of technical writing from a planning section to editing and publication. Some sections focus on specific aspects like translation and management.

The book reads like a textbook in a good way. It neatly separates information into teachable units and follows plain language principles and well formatted chapters. Each chapter lists its target audience with many chapters focusing on aspiring or beginning technical writers, career advancers, and cross-domain professionals. Some of the lessons share tips that could take years to learn. For example, providing understandable objectives for each reviewer so that subject matter experts are reviewing documents for content with no punctuation.

Notable in this second edition are the references to artificial intelligence (AI) and its role in technical communication. The authors mention it throughout the book and devote a chapter to practical ways to use (and not use) AI in your work. For example, they recommended using it as a means to streamline the technical writing process but cautioned that feeding proprietary information into this technology could be cause for termination if done without necessary approvals. In reference to current debates about AI replacing human workers, the authors took an optimistic approach and reminded readers that technical writing often focuses on ideas and innovations that are not yet documented, thus have not been incorporated into AI training sets.

A few drawbacks to this edition are the lack of color for the visuals and testimonials as it reduced their effectiveness. Also, the authors touted it as a textbook but did not include an index. The publisher provides additional resources online for a fee. That said, as a seasoned technical communicator, I appreciate the authors' inclusion of tools that have made my life easier (SnagIt, Trello, etc). I will recommend this book to new technical communicators and teams without designated documentation specialists.

Stephanie Saylor

Stephanie Saylor is a usability engineer and technical communicator from Maryland. She received her master's degree in digital communication from Johns Hopkins University.

The Sound of Writing

Christopher Cannon and Steven Justice, eds. 2024. Johns Hopkins University Press. [ISBN 978-1-4214-4725-4. 278 pages, including index. US$54.95 (softcover).]

Christopher Cannon and Steven Justice have collected ten historical essays in *The Sound of Writing* that explore the concept of what readers hear in their heads as they read classic literature, like Dante's *Inferno* and Chaucer's *Canterbury Tales*. This 250-page collection is misleading in length as each essay contains between 2–14 pages of referenced citations or referenced musical passages.

The authors open with an introduction that draws the reader into the concept of intersecting senses. Ancient writings of Aristotle trace the notion that the senses are intertwined or even inseparably conjoined. "Aristotle likened all sensation to the impression of an object into a piece of wax because he thought that whatever we see or hear (or taste or smell), we also touch, since every bodily perception is a mode of 'contact'" (p. 1). Some of Aristotle's observations reappeared in later works by Herder and even the opera composer Wagner. And even before Aristotle, the concept of sound in writing was observed in the cryptographic pictures of caves. Cannon and Justice contrast the approach of understanding sound from cave pictures with the concept of understanding sounds of the first letters coming together to form the Phoenician alphabet. That contrast introduces the purpose of every essay to explain their method of interpreting sound.

Sarah Nooter in her essay explores sound through the seeming silence of women in ancient Greek literature by tracing their epigrams and epitaphs—inscriptions written by women about the dead. She discovers the voices of these ancient Greek women "speaking through statuary, inscribed in verse, quoted as song, and depicted as rising from an entombed corpse" (p. 34).

Sarah Kay's essay uses medieval songs encouraging us to "read with our ears"(p. 40) because sound is depicted by a phonograph making an impression on wax. She connects that with Aristotle's explanation of how the senses intertwine by making an impression on one another.

Several essays explore medieval literature with the patterns of rhythm and sound in writing that may require having a formal education in world literature and poetry. Some of the vocabulary and discussion goes behind what an amateur might comprehend. One example is the discussion around speaking and the role of silence in Dante's *Inferno*. Another is the essay about the "final e" in the role of Middle English literature.

The last essay in the collection, "Writing Reading Rhythm," is the most helpful essay to read for an educated reader not specialized in historical literature and prose. Christopher Hasty explains in contemporary terms the components of sound included in modern writing, specifically rhythm. "In a world of literary artifacts, institutions, and practices, 'the sound of writing' can be heard as a reminder of the rhythmic energy and fluidity of sounding and resounding waves of writing and perhaps be heard, too, as a call for new ways of describing such processes in general and in particular" (p. 252). This statement is an appropriate conclusion to *The Sound of Writing*.

Julie Kinyoun

Julie Kinyoun is an on-call chemistry instructor at various community colleges in Southern California. An avid reader, she enjoys reviewing books that help her become a better educator.

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STC Summit Pre-Conference Courses (full day)	6
STC Summit Pre-Conference Courses (half day)	3
STC Annual Summit	8
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Presentations at conferences related to aspects of *Technical Communication* (2/presentation)	2
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Sean C. Herring, Editor

The following articles on technical communication have appeared recently in other journals. The abstracts are prepared by volunteer journal monitors. If you would like to contribute, contact Sean Herring at SeanHerring@MissouriState.edu.

"Recent & Relevant" does not supply copies of cited articles. However, most publishers supply reprints, tear sheets, or copies at nominal cost. Lists of publishers' addresses, covering nearly all the articles we have cited, appear in *Ulrich's international periodicals directory*.

Audience analysis

Running a double-blind true social experiment with a goal-oriented adaptive AI-based conversational agent in educational research

Cingillioglu, I., Gal, U., & Prokhorov, A. (2024). International Journal of Educational Research, 124, 102323. https://doi.org/10.1016/j.ijer.2024.102323

"This study introduces an innovative AI-facilitated interview-like survey system generating a combination of qualitative and quantitative data insights for higher education research. We employed a goal-oriented adaptive AI-based Conversational Agent (AICA) which collected data directly from 1223 participants globally and ran a double-blind true social experiment online. During interviews, the AI established strong rapport with the participants, offering them personalized guidance while fostering comfort, ownership, and commitment to the study. In this entirely automated experiment, we empirically tested 8 hypotheses related to students' university selection. The results confirmed 5 of these hypotheses while refuting 3 factors previously identified in the literature. The study showcases the potential of AICAs to efficiently collect and analyze data from substantial sample sizes in real-time, fostering a streamlined and harmonious research process producing results that are not only statistically reliable and bias-free but also broadly generalizable."

Yvonne Wade Sanchez

Communication

Beyond policy: What plants and communities can teach us about sustainable changemaking

Ledbetter, L., & Neelis, A. (2023). *Communication Design Quarterly, 11*(3), 21–27. https://doi.org/10.1145/3592367.3592370

In this paper the authors incorporate conversations occurring over a two-year period that "shed light on the informal and less-recognized ways that humans forge trust as they design communication to help each other survive as communities in times of scarcity." The authors' particular interest is in legitimizing "the communication pathways and resource exchange that [they] believe make for a sustainable food system centered around abundance rather than deficit… [so as to] start a greater conversation on how communities build trust and communication nimbly and quickly in times of crisis as policymaking often lags behind the needs of the community." The authors examine ways "ad hoc communities" met food needs during COVID-19 when formal policies and infrastructures (such as the US Department of Agriculture) failed to bridge the gap. The authors describe the inspiration they took "from the plants around us, farmers, scientists, community members, and the individuals and mutual aid groups that came together during the food crisis to build trust and dialogue as the first (and often most responsive) step towards sustainable food systems."

Lyn Gattis

Design

An exploratory study evaluating the influence of taller stripe patterns on reading comfort using ranking tests, readings tests, EEGs, and eye tracking

Renckens, M. (April 2024). *Visible Language, 58* (1), 6-37. https://doi.org/10.34314/w29ewx38

"The Latin script has a vertical stripe pattern in it, which is known to cause visual discomfort. This study started from the hypothesis that a lower stripe pattern could result in better visual comfort than a taller stripe pattern. I evaluated this hypothesis with several letterforms and their correlating stripe patterns, tested in four independent tests: a ranking test, reading progression, measuring neurological response, and measuring eye movements. The results provide some indications that taller stripe patterns are less comfortable, but those results were mostly outside the range of common letter sizes for reading texts. Also, results for letterforms and plain stripe patterns differed. The results suggest that multiple design parameters influence reading comfort simultaneously, and that 'the number of design details per surface' is a design parameter that could play an important role in determining reading comfort. This needs to be evaluated in further studies."

Diana Fox Bentele

"Infographing" dementia prevention: A co-design approach

Martinez Escobedo, I., Doherty, K., Eccleston, C. (2024). *Health Communication.* Advanced online publication. https://doi.org/10.1080/10410236.2024.2350257

"Designing effective public health messages is challenging, particularly when communicating complex and relatively new health messages such as dementia risk prevention which are still largely unfamiliar to the public. The accessibility of these messages, especially for individuals who speak English as an additional language, remains uncertain in large scale educational interventions. A key strategy to enhance the communication of evidence-based information is to co-design infographics that optimize the accessibility and impact of visual health messages. This paper reports on the co-design process of infographing dementia prevention messages. Qualitative data were analyzed using reflective thematic analysis to generate three themes reflecting the message design preferences of participants: "all hands on deck," "charting the course," and "get on board." This work supports the crucial need to engage the target audience via co-design when creating visual messages as meaningful and accessible educational tools that will resonate with the intended audience. Doing so may help health communicators navigate the creation of visual messages across diverse health domains and populations."

Walter Orr

Diversity

Making change happen: Exploring the change discourse of managers in a CSR context

Haas, A., & De Rozario, P. (2024). *International Journal of Business Communication*, *61*, 314-335. https://doi.org/10.1177/2329488420978601

"Diversity managers bear the responsibility of developing and implementing diversity policies. Despite advances in the legislation to fight discrimination, they often encounter resistance and need to generate change and to influence behaviors in the firm. Hence, they develop strategies to implement diversity within the organization. Based on the structuration approach developed by Giddens, and Barley and Tolbert, this research examines the discourse of diversity managers to generate change and institutionalize diversity. Based on a series of 37 in-depth interviews with diversity managers and experts in France, [the authors] identified eight scripts for diversity management in organizations. Whereas some scripts have the potential to generate change, others foster a 'business as usual' vision of diversity and are in fact non-diversity scripts. This research sheds light on the role of discourse in promoting diversity in firms. To disrupt organizational practices, discourse needs to unveil hidden prejudice, and to be embedded in legislation, time, and space."

Katherine Wertz

Veteran contempt for civilian communication scale: Development and validation

Howe, W.T. & Bisel, R.S. (May 2024). *Management Communication Quarterly, 38* (2), 249-278. https://doi.org/10.1177/08933189231186149

"This paper reports on the development and validation of a communication measure designed to assess how military veterans feel toward civilian communication. Specifically, we theorize that some veterans experience a mild negative moral emotion (i.e., contempt) toward civilians' communication habits. The emotion is likely a consequence of intense professional socialization and membership in a totalistic organization. Veterans who served in the military since September 11, 2001 (N = 215) responded to items, which were factor analyzed. Then, in a second study, the scale was validated using another sample of post-9/11 veterans (N = 466). Together, these studies contribute an original communication measure that could help identify whether a veteran will have difficulty reintegrating into civilian work life. The scale could be useful in developing interventions to aid veterans in successful reintegration. Ultimately, the measure holds the potential to promote workplace diversity through the successful inclusion of more veterans in the workforce."

Diana Fox Bentele

Education

The CCCC outstanding dissertation award in technical communication, 2004-2022: Doctoral research topics, methods, and implications for the field

Tham, J. (2024). *Technical Communication Quarterly, 33*, 200–226, https://doi.org/10.1080/10572252.2023.2229382

"This study extends the retrospective analysis of entries for the CCCC Outstanding Dissertation Award in Technical Communication (1999–2003) by Stuart Selber in 2004, focusing on the subsequent two decades (2004 to 2022), to identify the topical research areas and methodologies in technical and professional communication (TPC) via the winning entries of the award. Through descriptive content analysis of 29 dissertations and corresponding summary statistics, this study reports on TPC disciplinary emphases and growth based on the sponsoring institutions on these dissertations, featured topics and their research methods or methodologies, and projected implications for the field. Accordingly, this study reveals the state of TPC graduate research through the lens of the imminent award and what it means for doctoral researchers, their advisors, and programs."

Rhonda Stanton

Ethical issues

Ethical use of Artificial Intelligence for scientific writing: Current trends

Chetwynd, E. (2024). *Journal of Human Lactation*, 40(2), 211-215. https://doi.org/10.1177/08903344241235160

"Artificial intelligence (AI) is a big topic and is evolving rapidly. This About Research article will specifically focus on the use of AI in scientific writing and will not cover the myriad ways that AI is being used in scientific inquiry. It is titled "Current Trends" because it must be considered in the time it was written, which is early 2024. As the field evolves, the journal will continue to offer the latest guidelines to authors and links to the organizations working on ethics in the use of AI in publishing."

Yvonne Wade Sanchez

The AI ghostwriter effect: When users do not perceive ownership of AI-generated text but self-declare as authors

Draxler, F., Werner, A., Lehmann, F., Hoppe, M., Schmidt, A., Buschek, D., & Welsch, R. (2024). *ACM Transactions on Computer-Human Interaction*, 31(2), 1-40. https://doi.org/10.1145/3637875

"Human-AI interaction in text production increases complexity in authorship. In two empirical studies (n1 = 30 & n2 = 96), we investigate authorship and ownership in human-AI collaboration for personalized

language generation. We show an AI Ghostwriter Effect: Users do not consider themselves the owners and authors of AI-generated text but refrain from publicly declaring AI authorship. Personalization of AI-generated texts did not impact the AI Ghostwriter Effect, and higher levels of participants' influence on texts increased their sense of ownership. Participants were more likely to attribute ownership to supposedly human ghostwriters than AI ghostwriters, resulting in a higher ownership-authorship discrepancy for human ghostwriters. Rationalizations for authorship in AI ghostwriters and human ghostwriters were similar. We discuss how our findings relate to psychological ownership and human-AI interaction to lay the foundations for adapting authorship frameworks and user interfaces in AI in text-generation tasks."

Yvonne Wade Sanchez

Health communication

Amplifying diverse narratives of social support in online health design

Cameron, S. (2023). *Communication Design Quarterly, 11*(3), 54–66. https://doi.org/10.1145/3592367.3592373

"This article interrogates the competing narratives present in one online community for Asherman syndrome to highlight how certain stories about infertility/parenthood thrive in online discussions while others are suppressed or silenced. The author argues that employing a research stance centered on reproductive justice creates new possibilities for coalition building across differences in community-engaged research design. As reproductive justice frameworks aim to protect all reproductive freedoms, these methods eschew cohesive narratives and instead prioritize amplifying diverse patient voices. The article concludes with patient recommendations for communication design interventions to improve user experience with social support online."

Lyn Gattis

"Trust me, I'm a doctor."How TikTok videos from different sources influence clinical trial participation

Hong, Y., Lee, N., Kirkpatrick, C.E., Hu, S., Lee, S., Hinnant, A. (2024). *Health Communication.* Advanced online publication. https://doi.org/10.1080/10410236.2024.2346680

"This study experiments with TikTok videos to promote clinical trial participation. More specifically, it examines how short-form video sources (doctors vs. prior volunteers for clinical trials) influence perceived source credibility, self-efficacy, and behavioral intention to participate in clinical trials. Findings from this online experiment (N = 396) showed that doctor sources led to greater behavioral intention through enhancing source credibility compared to prior volunteer sources. Alternatively, prior volunteer sources increased behavioral intention via enhanced self-efficacy for participants with low trust in doctors. These findings contribute to the understanding of how short-form video sources act as heuristic cues, leading to persuasion outcomes. Overall, we recommend featuring doctors when using video-based messages to promote clinical trial participation. Also, this study emphasizes the need for health communication practitioners to consider prior volunteers as spokespersons when targeting populations with low baseline trust in doctors."

Walter Orr

Information management

(Dis)organizing sexual harassment: Patterns of bystander communication

Ivancic, S.R. & Ford, J.L. (May 2024). *Management Communication Quarterly, 38* (2), 331-358. https://doi.org/10.1177/08933189231179653

"This study explores organizational bystander responses to sexual harassment in order to understand how bystanders facilitate healing, perpetuate harm, and create tensions for individuals who experience workplace sexual harassment. This qualitative analysis expands our understanding of bystander communication in several ways. First, we present patterns of constructive and destructive bystander communication practices

and introduce the concept of holistic support. Second, we analyze how responses by organizational bystanders (dis)organize sexual harassment or ignite fears of (dis)organization. Last, we introduce a continuum of bystander response patterns that demonstrate the tensions targets of sexual harassment navigate when interacting with bystanders. Findings illuminate the possibilities for workplace transformation and we provide recommendations for how to best support individuals who are sexually harassed."

Diana Fox Bentele

Participatory practices during organizational change: Rethinking participation and resistance

Sahay, S. & Goldthwaite, C. (May 2024). *Management Communication Quarterly, 38* (2), 279-306. https://doi.org/10.1177/08933189231187883

"To encourage buy-in and manage resistance, change managers utilize participatory strategies. This study examined the communication practices and perspectives of implementers and employees as they negotiated the change participation process to better understand resistance dynamics. Data were collected through interviews (n = 37) and observations (n = 2) with nurses and change implementers in a medical center. Grounded practical theory was used to reconstruct the stakeholders' normative theories of participation in which multiple and often contradictory perspectives emerged. Asking employees to participate reduced implementers' perceptions of control and increased their feelings of vulnerability. Implementers often equated participation with resistance and used different communication techniques to shape how nurses shared ideas, influencing their participation. Theoretically, this article adds to the study of participation and resistance by showing how resistance is constituted through communication by both implementers and change recipients as they attempt to navigate the inevitable contradictions that arise during the change process."

Diana Fox Bentele

Intercultural communication

Climate change as represented in corporate social responsibility reports of American and Chinese energy giants: A critical frame analysis perspective

Zhang, Y., & Zhang, J. (2024). *International Journal of Business Communication*, *61*, 414-451. https://doi.org/10.1177/23294884231208176

"Adopting a critical frame analysis perspective, this study investigates how American and Chinese energy giants represent and frame climate change in their corporate social responsibility reports, and reveals the respective underlying motivations and ideologies. The results show that the eight energy giants all recognized climate change, barely diagnosed its causes, slightly interpreted its impacts, but placed heavy emphasis on their solutions. They divert responsibility and criticism, through representing themselves as a victim and solver rather than a contributor. The frames identified in both corpora include Emission Management frame, Techno-optimism frame, Countermeasures frame, and Stakeholder Engagement frame, with common and distinct characteristics across the two corpora. The analysis of representations and frames exposes shared motivations such as greenwashing, legitimacy, and stakeholder engagement. However, these motivations indicate distinct ideologies, with American energy giants' ideological denial, a subtle form of climate denialism, and Chinese energy giants' green growth ideology, striving for a green, low-carbon development while reducing emissions."

Katherine Wertz

Tracking CSR communication research within the Chinese context: A systematic literature review

Dong, C., Song, B., Cheng, Y., & Zheng, Q. (2024). *International Journal of Business Communication, 61*, 385-413. https://doi.org/10.1177/23294884231156508

"Considering the globalization of corporate social responsibility (CSR), China has become an important and distinctive market for CSR practice and research.

Communication, as a fast-growing subfield of CSR research, has made substantial contributions to the theorization of CSR yet has been dominated by Western contexts. To provide a contextualized view of CSR communication, this study systematically examined the 88 articles of CSR communication research published in peer-reviewed journals with a focus on the Chinese context. Findings revealed the unique characteristics of Chinese CSR and the status of Chinese CSR communication literature in terms of publication trend, authorship/institution, RQ/Hypothesis, research topics, research context, theoretical frameworks, and methodological approaches. In addition, this study identified gaps in the current Chinese CSR communication research. It offered directions for future development regarding strengthening conceptual development, innovating methodological approaches, and expanding research topics and scopes."

Katherine Wertz

Leadership

Social media influencer effects on CSR communication: The role of influencer leadership in opinion and taste

Cheng, Y., Hung-Baesecke, C.-J. F., & Chen, Y.-R. R. (2024). *International Journal of Business Communication, 61*, 336-359. https://doi.org/10.1177/23294884211035112

"With the prevalence of social media usage among consumers, brands have increasingly utilized paid social media influencer (SMI) endorsements in their corporate social responsibility (CSR) communication. However, how such practice generates positive consumer responses is not well understood. Drawing from signaling theory, social learning theory, and social identity theory, a structural equation model analysis was conducted to test [the authors'] hypotheses and proposed model based on the survey data from 592 U.S. consumers. The research results suggest that a brand's CSR initiatives, when endorsed by SMIs who are perceived as social media leaders in opinion and taste, directly enhance consumers' CSR communication engagement about the initiatives and do so indirectly via the consumers' reduced CSR skepticism. Reduced CSR skepticism and enhanced CSR communication engagement ultimately lead to the consumers' brand loyalty, brand preference, and price premium. The study has implications for CSR advertising/social-mediated communication, SMI leadership, and SMI endorsement effects."

Katherine Wertz

Spotlight on a thought leader - how to become an effective communicator: Schulz von Thun's contribution to business communication

Bünzli, F., & Eppler, M. J. (2024). *International Journal of Business Communication, 61*, 484-491. https://doi.org/10.1177/23294884231224118.

"This article explores the ingredients of effective business communication, presenting the extensive work of German psychologist and communication expert Friedemann Schulz von Thun. Over the course of his 50-year career, Schulz von Thun has developed numerous frameworks and tools that enhance our understanding of how to talk to one another to settle disagreements, promote strong relationships and foster individual as well as organizational success. [The authors] offer a concise synthesis of his most influential concepts (i.e., the square of communication, the inner team, and the value square) and illustrate their application in communication research and practice."

Katherine Wertz

Political discourse

A dangerous, costly neighborhood: A critique of blight and obsolescence claims in local media coverage of a planning project

Elliot, T. J. (2024). *Technical Communication Quarterly, 33,* 182–199, https://doi.org/10.1080/10572252.2023.2229381

"This article examines how local newspaper stories in a college town created a dominant cultural narrative about an urban redevelopment project using tropes of physical

blight and financial obsolescence. The article discusses descriptive tactics that appear throughout 16 years of coverage alongside patterns in the stories' frequency, focus, and authorship. The conclusion shares a series of practical takeaways for technical writers looking to collaborate with communities facing redevelopment."

Rhonda Stanton

Public relations

Exploring variations in corporations' communication after a CA versus CSR crisis: A semantic network analysis of sustainability reports

Park, K., Kim, H., & Rim, H. (2024). *International Journal of Business Communication, 61*, 240-262. https://doi.org/10.1177/2329488420907148

"The study attempts to understand corporations' efforts to communicate their values and commitment to stakeholders after a crisis. Specifically, the study explores the characteristics of communication efforts that may differ depending on the reputational crisis types: corporate ability (CA) and corporate social responsibility (CSR) crises. Employing a series of semantic network analyses, the study examined the sustainability annual reports of two Korean airlines (i.e., Korean Air and Asiana Airlines) published before and after their recent crises. Results showed how sustainability reports' central keywords, social issues the companies support, and prioritized stakeholders varied in response to the different types of crises. Word frequency results showed that there was an increasing trend in emphasizing the word 'safety' after both types of crisis, while a noticeable decrease in emphasis on the word 'ethics' was observed after CA crisis. The results of semantic network analyses showed that Korean Air's sustainability reports seemed to focus more on aspects of the relationship with stakeholders after the CSR crisis, while Asiana Airlines appeared to place more emphasis on business-related notions after the CA crisis. Theoretical and practical implications are discussed."

Katherine Wertz

Firm-determined or consumer-determined corporate social responsibility (CSR)? Examining the effects of choice-of-cause in cause-related marketing

Tao, W., & Ji, Y. G. (2024). *International Journal of Business Communication, 61,* 263-286. https://doi.org/10.1177/2329488420918397

"As a widely practiced form of corporate social responsibility (CSR), cause-related marketing (CRM) programs have been considered effective in generating reputational, relational, and financial returns for companies. This study examines a new form of CRM: choice-of-cause programs, in which companies empower consumers to determine which social causes to support. Based on self-determination theory, reputation management literature, and CSR research, this study proposes a conceptual framework that theorizes the effectiveness of the choice program, mapping out consumers' psychological experiences and consequential attitudinal and behavioral intention responses toward companies and their nonprofit partners. Results of an online experiment offer partial support to the framework. They showed the relative advantage of the choice program over traditional cause-without-choice practice and highlighted the importance of creating an autonomy-supportive CSR program environment where consumers can exercise self-determination. Furthermore, results demonstrated the crucial role of corporate reputation in influencing consumer responses in CSR programs."

Katherine Wertz

The role of public skepticism and distrust in the process of CSR communication

Kim, S., & Rim, H. (2024). *International Journal of Business Communication, 61*, 198-218. https://doi.org/10.1177/2329488419866888

"Through a cross-sectional online survey, this study examines the moderated mediation model of public skepticism toward organizational altruism and public distrust of CSR messages in the process of corporate social responsibility (CSR) communication. Focusing solely on CSR communication elements rather than CSR practice, this study sheds light on the significant role that effective CSR communication elements play

in attenuating public skepticism and further inducing positive public evaluations of an organization. [The authors'] results suggest that skepticism toward altruism is significantly reduced by the six effective CSR communication elements—CSR informativeness, transparency, objectivity, consistency, personal relevance, and a less promotional tone. In turn, an organization is able to restore the publics' positive evaluation of it. Although this study confirms the moderating role of public distrust in the process, it also reveals this moderating role to move in an unexpected direction. That is, the positive effects of effective CSR communication elements are much greater for people who have stronger distrust of CSR messages than those with less distrust. This indicates that public distrust of CSR messages (developed over time) may be overcome with quality CSR communication."

Katherine Wertz

Research

Cannabis risk communication: A scoping review with a research agenda

Madson, M. (2024). *Technical Communication Quarterly, 33*, 140-181, https://doi.org/10.1080/10572252.2023.2229871

"Government leaders have called for messaging and prevention programs that target cannabis, which, in recent years, has been viewed more favorably in the public eye. In these efforts, technical communication scholars can make meaningful contributions, and as a start, this article presents a scoping review of three key areas in cannabis risk communication: physician/patient interactions, social media, and cannabis-related businesses."

Rhonda Stanton

Rhetoric

"Dainty, sparkling, delicious": Jell-O constructions of White femininity

Dubisar, A. M. (2024). *Technical Communication Quarterly, 33,* 109–121, https://doi.org/10.1080/10572252.2023.2216248

"Joining the growing scholarly conversation on food rhetorics and technical and professional communication (TPC), this rhetorical analysis addresses two themes that arise in a Jell-O booklet (circa 1913): 1) constructing white femininity through women's frustration and technical failure related to cooking and 2) asserting the Black mammy stereotype as a mechanism of maintaining white supremacy. Such analysis illustrates how food-related artifacts construct ideologies as they simultaneously offer technical instruction."

Rhonda Stanton

Job interview preparation: A practical exercise in the rhetoric of oral argument

Plung. D.(May 2024). *Business and Professional Communication Quarterly, 87* (1), 177-193. https://doi.org/10.1177/23294906221142541

Since many technical writing students are anxious to apply skills taught in training for careers, there are rhetorical elements, especially ethically sound persuasive arguments and job interviews, that can be helpful to review. "Job interviews require applicants to demonstrate two things: experience with direct value to the company and a fit with the team and company culture. A technique is detailed demonstrating how to develop this argument based on aligning credentials with corporate interests, developing advocacy-based themes, and synthesizing material into a convenient study guide. Designed for instruction in either the college classroom or corporate training center, the approach provides professional communication students with a unique, practical, and personally meaningful learning exercise assessing rhetorical situations, examining rhetorical constructs, and delivering persuasive arguments."

Diana Fox Bentele

Toward rhetorically infused methods for relational network modeling: The visualization of agency in seismic risk visuals

DeVasto, D. (2024). *Technical Communication Quarterly, 33,*122–139, https://doi.org/10.1080/10572252.2023.2216729

"This article presents a pilot study in agentive modeling, a mixed-methods approach for visualizing networked models of agency. The study assesses technical and public seismic risk visuals from the websites of key organizations concerned with seismic activity. Preliminary findings indicate the need for visuals that stage more complex networks in order to create greater opportunities for engagement and danger-reducing action."

Rhonda Stanton

Scientific writing

Navigating genres in interdisciplinary life sciences doctoral programs

Doody, S. (2024). *Technical Communication Quarterly, 33*, 227–244, https://doi.org/10.1080/10572252.2023.2229398

"This article explores how doctoral writers in interdisciplinary life sciences programs navigate genre-ing activities across multiple disciplines. In interdisciplinary environments, approaches to doing and teaching writing may benefit from a reimagining, particularly as findings suggest that writing at interdisciplinary boundaries is unsuited to apprenticeship models of pedagogy. I argue that meta-genre is a productive way of engaging with the destabilization of existing knowledge in technical communication in interdisciplinary spaces and of fostering interdisciplinary writing knowledge."

Rhonda Stanton

Social Justice

Decolonizing community-engaged research: Designing CER with cultural humility as a foundational value

Itchuaqiyaq, C. U., Lindgren, C. A., & Kramer, C. Q. (2023). *Communication Design Quarterly, 11*(3), 12–20. https://doi.org/10.1145/3592367.3592369

"In this article, [the authors] uptake the call for equipping researchers in practicing socially just CER in Indigenous communities through developing a framework for cultural humility in CER. Sparked by [the] research team's experience considering the potential of CER to transform and contribute to the needs of both tribal and academic communities, [they] present cultural humility as a personal precondition for socially just, decolonial CER practice. {The authors] use the Inuit cultural practice of nalukataq as a key metaphor to present [their] framework for cultural humility: listening to the caller, setting your feet, pulling equally, staying in sync."

Lyn Gattis

Tracing the development and circulation of a tool for coalitional change

Moore, K. R., & Stone, E. M. (2023). *Communication Design Quarterly, 11*(3), 67–72. https://doi.org/10.1145/3592367.3592374

"This experience report describes the origin story and use journey of a visual tool for community engagement and organizational change work. [The authors] articulate the tool (i.e., the pyramid) as a theoretical framework and demonstrate how the tool has been used to intervene in organizations, engage coalitions, and mitigate risks as we move towards a more socially just future. It is both all about community-engaged research and also not about it at all: [the authors] built it in and with communities and coalitions and … have also brought it to communities and coalitions, adopted it, adapted it, and reinvented uses for it. By tracing its development and circulation, [the authors] are both documenting its past and present use cases and offering it up as a tool for others to adopt and adapt."

Lyn Gattis

Social Media

Driving employee engagement through CSR communication and employee perceived motives: The role of CSR-related social media engagement and job engagement

Jiang, H., & Luo, Y. (2024). *International Journal of Business Communication, 61*, 287-313. https://doi.org/10.1177/2329488420960528

"Employee engagement and corporate social responsibility (CSR) are two important issues attracting an increasing amount of attention from both business communication researchers and practitioners. A theory-driven model that (1) conceptualizes employee engagement as social media engagement, job engagement, and organizational engagement, and (2) explicates how they are related to an organization's CSR communication strategies and employee perceived CSR motives is still lacking. To place [the authors'] study in the context of CSR and business communication, [the authors] proposed a *strategies-motives-employee engagement* model. Results from an online Qualtrics survey (n = 836) supported all [the authors'] hypotheses except for the direct link between interacting CSR communication strategies and employee organizational engagement. [The authors] conducted a two-step Structural Equation Modeling (SEM) analysis to test all [the authors'] hypotheses. Theoretical and practical implications of the study were discussed."

Katherine Wertz

NPOs' voice in CSR partnership: An exploratory study using topic modeling

Dong, C., & Zhang, Y. (2024). *International Journal of Business Communication, 61*, 219-239. https://doi.org/10.1177/2329488418819136

"The present study aims to identify and interpret the emerging strategies employed by nonprofit organizations (NPOs) in communicating with their business partners on Twitter. A computer-assisted content analysis was applied to analyze 5,661 tweets posted by 65 NPOs. The study identified three corporate social responsibility communication strategies, which were characterized by a distinctive emphasis on stakeholder engagement. [The authors] analyzed NPOs that targeted different issues-initiated corporate social responsibility partnership conversations at varying levels by adopting self-promotional, partner-oriented, and balanced-interest strategies to justify and promote their relationships with multiple stakeholders on Twitter. This exploratory study contributes to the scant research on cross-sector social partnerships communication from a nonprofit perspective and adds nonprofit-specific evidence to the existing theories and practices."

Katherine Wertz

Technology

Generative AI and the future of higher education: a threat to academic integrity or reformation? Evidence from multicultural perspectives

Yusuf, A., Pervin, N., & Román-González, M. (2024). *International Journal of Educational Technology in Higher Education*, 21(1), 21. https://doi.org/10.1186/s41239-024-00453-6

"In recent years, higher education (HE) globally has witnessed extensive adoption of technology, particularly in teaching and research. The emergence of generative Artificial Intelligence (GenAI) further accelerates this trend. However, the increasing sophistication of GenAI tools has raised concerns about their potential to automate teaching and research processes. Despite widespread research on GenAI in various fields, there is a lack of multicultural perspectives on its impact and concerns in HE. This study addresses this gap by examining the usage, benefits, and concerns of GenAI in higher education from a multicultural standpoint. We employed an online survey that collected responses from 1217 participants across 76 countries, encompassing a broad range of gender categories, academic disciplines, geographical locations, and cultural orientations. Our findings revealed a high level of awareness and familiarity with GenAI tools among respondents. A significant portion had prior experience and expressed the intention to continue

using these tools, primarily for information retrieval and text paraphrasing. The study emphasizes the importance of GenAI integration in higher education, highlighting both its potential benefits and concerns. Notably, there is a strong correlation between cultural dimensions and respondents' views on the benefits and concerns related to GenAI, including its potential as academic dishonesty and the need for ethical guidelines. We, therefore, argued that responsible use of GenAI tools can enhance learning processes, but addressing concerns may require robust policies that are responsive to cultural expectations. We discussed the findings and offered recommendations for researchers, educators, and policymakers, aiming to promote the ethical and effective integration of GenAI tools in higher education."

Yvonne Wade Sanchez

Usability studies

A direct functional measure of text quality: Did the reader understand?

Grabowski, J. & Mathiebe, M. (April 2024). *Written Communication Quarterly, 41* (2), 203-229. https://doi.org/10.1177/07410883231222952

"Assessing text quality as an indication of underlying skills still remains challenging; irrespective of the approach, many studies struggle with reliability or validity problems. If writing is considered problem-solving, a report must make the reader understand the described situation and call for its mental reconstruction. Therefore, text quality may not only comprise linguistic aspects but also the cognitive-functional power of a text. The presented study aims at exploring the functionality of students' reporting texts in relation to general text-quality measures, using a corpus of accident reports … An online tool was developed in which 277 university students graphically reenacted the situation from one respective text … While most subscales showed sufficiently high interrater reliabilities, the aggregated functionality score (α = .74) had medium-high correlations with other text-quality ratings and was comparably dependent on grade, education level, and linguistic family background… . Altogether, the approach of indicating text functionality through practical understanding offers a sound, though empirically laborious, alternative for text-quality measurement. Results are discussed with regard to the didactical strategy according to which students can improve their writing when they observe whether others can make use of their texts."

Diana Fox Bentele

ARCO mapping the cognitive dynamics of communication expectations: An approach to designing usable content based on audience expectations

St. Amant, K. (2024). *Journal of Technical Writing and Communication, 54*(2), 206-229. https://doi.org/10.1177/00472816231187354

"The usability of items is connected to cognition, or how the brain processes information. Many of the related processes occur subconsciously and are guided by the mental models individuals have created based on their experiences. The better communication professional and communication students understand such dynamics, the more effectively they can create usable content for an audience. This article presents an approach, the Actualization, Recognition, Categorization, Operationalization (ARCO) method, for identifying the mental models that influence usability expectations. Individuals can use the results of this process to create content that better addresses an audience's usability expectations."

Anita Ford

Perspectives on usability testing with IoT devices in technical communication courses

Wright, D. (2024). *Technical Communication Quarterly, 33*, 38–53, https://doi.org/10.1080/10572252.2023.2194345

"This article offers perspectives on adopting smart home technology into usability testing for technical and professional communication (TPC) courses. Usability is a valued skill for technical communicators. However, usability testing methods have their problems as pedagogical tools. Internet-of-Things (IoT) devices and

Smart Home Technology (SHT) may offer instructors tools to overcome some of those problems. This article details advantages and concerns associated with using SHT for curricular usability testing."

Rhonda Stanton

User experience

Designing for trust: The crucial role in digital user experiences

Bhaskaran, V. (2024). *Journal of User Experience, 19*(2), 53–59. [doi: none]

This invited essay addresses the importance for businesses of creating meaningful, reliable digital experiences that build user trust and loyalty. "When product and design teams exclusively dedicate their focus to individual touch points—a webpage, an app interface, or a service interaction—they unwittingly create an emotional disconnect. Humans don't experience life in isolated moments; they weave each interaction into the fabric of a larger, interconnected journey. Focusing solely on touchpoint design risks crafting an illusion and misses the emotional synergy that users enjoy across diverse stages of engagement… . A seamless, trustworthy journey demands a cohesive narrative across multiple touch points. The opportunity then, for design teams, is to transcend the allure of singular moments and embrace the challenge of orchestrating a narrative that resonates emotionally and consistently across multiple touchpoints and across varying time horizons." The author discusses several design factors contributing to user trust, including '[t]ransparent communication, security measures, intentional visual design, and user empowerment."

Lyn Gattis

ESUS: Aligning and simplifying SUS for enterprise applications

Schneider, S., Hillman, S., Bach, P., & Ma, G. (2024). *Journal of User Experience, 19*(2), 60–74. [doi: none]

"Throughout the last few decades, researchers have developed standard usability questionnaires to evaluate usability and present a single score that represents a product's overall level of ease of use. One of the most notable questionnaires is the System Usability Scale (SUS) (Sauro & Lewis, 2009). However, since the SUS was introduced in 1986, products and services have not only undergone monumental advancements in technology, but Human-Computer Interaction and user experience research practices have matured. These changes are also true in the enterprise space. In this paper, [the authors] present preliminary evidence concerning the construct validity of a new usability questionnaire with three advantages for enterprise applications over the original 10-item SUS questionnaire. The Enterprise System Usability Scale (ESUS) offers better measurement of usability for technical products/services, reduced questionnaire items, and alignment with enterprise environments. Results indicate that the ESUS exhibits a similarly strong correlation with satisfaction as the SUS and is strongly correlated with SUS for enterprise and enterprise data products/services."

Lyn Gattis

Generalized User Experience Questionnaire (UEQ-G): Holistic measurement of multimodal UX

Boothe, C. S., Strawderman, L., Burch, R. F., Smith, B. K., Bethel, C. L., & Holmes, K. (2024). *Journal of User Experience, 19* (2), 75–103. [doi: none]

"The User Experience Questionnaire (UEQ) is a commonly used tool for measuring product experience. This study covers extending the UEQ to measure multimodal experiences that include both product and service experiences. Currently, no questionnaires measure holistic user experiences, including pragmatic and hedonic qualities, for both product and service experiences. Through three study phases, [the authors] created and tested the Generalized User Experience Questionnaire (UEQ-G). First, [they] generalized

and tested language from the UEQ's original, product experience context. Second, the UEQ-G was applied to controlled service experiences in which conditions were artificially manipulated across traditional UEQ factors. Third, [they] applied the UEQ-G in the field to experiences that contained both product and service experiences within the same scenario… . This study found the UEQ-G to be as valid and reliable as its predecessor, UEQ, in product experience scenarios, and although additional study is required, the UEQ-G showed great potential in evaluating service experience scenarios and for evaluating multimodal experiences in the field. With additional study, the UEQ-G tool could be the first tool of its type for assessing holistic user experience across various multimodal experiences."

Lyn Gattis

Writing

Story of a community-based writing resource—and a call to engage

Blakeslee, A. M., Gatchel, K. M., Boeving, D., & Miller, B. (2023). *Communication Design Quarterly, 11*(3), 42–53. https://doi.org/10.1145/3592367.3592372

"This article tells the story of YpsiWrites, a community writing resource that provides support, resources, and programs for all writers. It shows how ideas from adrienne maree brown's Emergent Strategy (2017) provide a generative framework for community-engaged initiatives. It uses this framework to examine the work of YpsiWrites, and, in doing so, illustrates the value of the framework for planning, carrying out, and assessing community-engaged work (CEW). The authors share responses to questions they posed to stakeholders, along with themes from those responses, which paint a more nuanced picture of the nature and potential of this work. They conclude with a call to engage and an invitation for others to use these questions as a heuristic in pursuing their own, unique community-engaged work."

Lyn Gattis

Stories or expositive messages? Comparing their effectiveness in corporate social responsibility communication

Pérez, A., Baraibar-Diez, E., & García de los Salmones, M. del M. (2024). *International Journal of Business Communication, 61*, 360-384. https://doi.org/10.1177/2329488420939255

"In the context of corporate social responsibility (CSR) communication, [the authors] explore whether consumer perceptions and responses differ when the message content is based on storytelling or exposition. The conceptual model that [the authors] propose in the article includes five attributes of CSR message content (i.e., issue importance, CSR impact, CSR motives, CSR fit, and CSR commitment) and their relationships to two types of consumer responses (i.e., purchase and advocacy). [The authors] collected data from 444 participants who evaluated the website of a fictitious restaurant chain that included information about its CSR activities using (a) storytelling or (b) expositive CSR messages. The findings suggest that the use of storytelling notably improves perceptions of issue importance, CSR impact, CSR fit, and CSR commitment. On the contrary, the type of CSR message does not differentiate consumer perceptions of corporate CSR motives. The use of storytelling or an expositive CSR message also has a significant impact on the conceptual model, with consumers responding more or less intensively to each attribute of the CSR message content depending on the type of message they are exposed to."

Katherine Wertz